



Emotional Intelligence as A Predictor of Academic Achievement of Secondary School Students in Biology in Awka Education Zone, Anambra State

Mbaegbu, Chioma S.^a, Ikeanumba, Chukwuemeka B.^b, & Anazodo, Onyinye S.^a

^a Department of Science Education, Nnamdi Azikiwe University, Awka, Anambra State, Nigeria

^b Department of Educational Foundations, Nnamdi Azikiwe University, Awka, Anambra State, Nigeria

Corresponding author: cb.ikeanumba@stu.unizik.edu.ng

Abstract

Emotional intelligence is the ability to understand, use, and manage your own emotions in positive ways to relieve stress, communicate effectively, empathize with others, overcome challenges and defuse conflict. This study examined emotional intelligence as a predictor of academic achievement of secondary school students in biology in Awka education zone, Anambra State. Three research questions guided the study as well as three hypotheses tested. The study adopted the predictive correlational research design. The population of the study consists all 4,421 senior secondary two (SS2) (2,632 female and 1,789 male) students offering Biology in Awka Education zone. 240 biology SS2 students were sampled for the study using simple random sampling. A standardized Emotional Intelligence Questionnaire (EIQ) adapted from Mayer, Salovey, and Caruso (2004) Emotional Intelligence Test (MSCEIT) was used to collect data. The instrument was validated by two experts and a reliability index of 0.82 was obtained. Direct delivery method was used to collect data. Simple linear regression was used to answer the research questions while ANOVA was used to test the null hypotheses at 0.05 level of significance. The findings of the study showed among others that emotional intelligence significantly predicted secondary school students' academic achievement in biology. The findings of the study also showed that the emotional intelligence of both male and female students significantly predicted their academic achievement in biology. It was recommended among others that school counselors should check on students' emotional intelligence level and develop orientation programs that could help them improve on the level of their emotional intelligence.

Keywords: Emotional Intelligence, Predictor, Academic Achievement, Biology

Introduction

Education boosts the opportunities for sustainable development and plays a crucial role in the overall development of the individual, society and nation at large. Education is the most important avenue for improving the quality of life of an individuals and his/her adaptation to the society. For this reason, education of every citizen should be taken seriously. Federal Republic of Nigeria (2020) recognized education as bedrock of every human and national development. A nations' position in today's highly competitive global knowledge economy is directly dependent on the quality of its human capital this includes, the aggregate of skills and knowledge imparted to its citizen by its educational system (Ahmed, 2017). The relevance of education well emphasized and science oriented courses has identified biology as an important science subject towards the nations' development.

Biology is a vital and most popular subject among secondary school students. This is understandably so, given that Biology is the backbone of many inventions in science such as biotechnology, genetic engineering, DNA technology, pharmaceuticals, health education

and environmental education which have led to improved living condition of man in his environment.

The common attention givento biology as a subject could be because it is a natural subject which enlightens the students on day to day living, their environment, plant and animals as well as their health. Biology is the study of living organism (Akunwa & Obidiwe, 2013). Biology if properly taught, will not only serve as a pre-requisite and school requirement for further science study but also a means of helping an individual to understand himself well and develop a good use and functioning of all his senses as well as manipulative skills development. Hence, the need for effective Biology education in Nigeria appears very crucial and therefore, demands considerable attention. Despite the relevance of Biology and the fact that it is one of the core subjects recommended by the Federal Republic of Nigeria (FRN, 2020) in the National Policy on Education. There has been a problem of poor achievement among secondary school students. For the past three consecutive years (2020-2022), the academic performance of candidates in Biology in Anambra State has not appreciated as expected for Biology, being the only subject offered by both



science and arts students. This is evidenced by the results released by West African Examination Council (WAEC) in 2020, 2021 and 2022 which revealed that only 49.28%, 48.82% and 48.07% respectively of the candidates in Anambra State that sat for Biology examination made credit passes in the subject (WAEC Results for Anambra State, 2020, 2021 & 2022). The importance of biology in national development has necessitated the inclusion of its study in the curriculum of most nations of the world so as to promote students' academic achievement.

Academic achievement is an important factor in the teaching and learning of any subject including biology. Academic achievement is the outcome of instruction; it depicts the extent to which the goal of instruction has been achieved both by the teacher and by the students (Spinath, 2012). Academic achievement is referred to be the observed and measured aspects of students' mastery of skills and subject contents as measured with valid and reliable test (Joe, et al. 2014). In any school system, academic achievement is a priority to the student as well as the teacher. The teacher, students and the school administration must put effort to see that high academic achievement is attained. It is sad to note that secondary school students' academic achievement in biology in Nigeria have remained poor. A lot of factors have been attributed by researchers as being responsible for the poor academic achievement of biology students, among these factors include; poor teaching method, non-availability of modern laboratory, large class size, family background and learner's background knowledge. The focus of most studies directed towards proffering solution to the problem of poor academic achievement among secondary school students, have continued however to neglect the role of students' psychological attributes in their academic achievement. Teachers and school counselors pay little or no attention to the place of such attributes as students' emotional intelligence and its role in the academic achievement of students in learning.

Emotional intelligence is a psychological construct derived from two terms: Emotion and intelligence. Intelligence belongs to the cognitive (thinking, reasoning) aspect of mental functioning while emotions belong to the affective (feeling, appreciation) aspect of mental functioning. Simply put, intelligence is the ability to acquire, understand and comprehend information or knowledge as well as being able to transfer the acquired knowledge for problem solving while emotion means state of mood of an individual.

Emotional intelligence (EI) is vital in explaining students study habits as well as academic outcomes/achievements. Emotional intelligence and academic achievement are closely related. There has been substantial evidence proving that being emotionally intelligent can help individuals excel through life transitions starting from school to college, and later into to the working world. At the college level, emotional intelligence is seen as a valuable skill that helps students to manage and cope with the demanding nature of the academics. Supporting the above statement, Jeanne, Melinda-Smith, Lawrence and Shubin (2021) observed that it is not the brilliant or smartest people who are the most successful or the most fulfilled in life. The authors argued that some academically brilliant individuals are yet socially inept and unsuccessful at work, in academics or their personal relationships. According to Kolachina (2014), "Emotionally intelligent student would have better academic achievement or through EI there is a possibility of improvement of academic achievement." Many research findings have proven that there is significant relationship between Emotional Intelligence and Academic Achievement. Yelkikalan et al. (2012) states that almost 11% of change in academic achievement can be explained by emotional intelligence. Chew et al. (2013), concluded that as compared to students with low emotional intelligence students with high emotional intelligence perform better in both continuous assessments and the final professional examination. Preeti (2013) states that academic achievement alone is not enough for future success and that both emotional intelligence and academic achievement are needed for future success. So, from the above researches conducted by various researchers we can see that emotional intelligence is closely related to academic achievement. In addition to that, being emotionally intelligent does not only help students to learn better but it also determines their career success, especially for those who want to embark into a profession that requires high level of emotion related competence, such as teaching. Psychologically, a student lack of control over his/her emotion may result to some physical health, mental health, relationship and empathy (social intelligence) challenges which ultimately wheels tremendous influence on his/her academic pursuit and achievement (Oramadike and Uzochukwu, 2021). To buttress this point, inability to manage emotions is equal to not managing of stress which has physical health challenges. This can also impact on a person's mental

health thus resulting in anxiety, tantrum and often depression which are enemies to academic excellence. Students ability to pay attention to their emotions, experience feelings with clarity and being able to recover from negative states of mind often have a decisive influence on students' mental health and this psychological balance in turn is related to and ultimately affects academic achievement.

The difference between males and females where overall EI was concerned was inconsistent in various parts of the world. Chandra, Gayatri, & Devi, (2017) opined that in medical graduates, females have higher EI than males and females had higher mean EI scores among medical undergraduates. In support of this, Domakani, Mirzaei, and Zeraatpisheh (2014) found that females have greater overall EI and are better at interpersonal skills, adaptability, and pragmatic knowledge than males. Are students with limited emotional and social skills more likely to experience stress and emotional difficulties during their studies, and consequently suffer from poor academic achievement? Are students who believe that their performance at tests and examinations depends on their ability rather than on luck and chance likely to do better? Does emotional intelligence predict students' academic achievement in biology? These questions give credence to the need to investigate the extent to which Emotional intelligence predicts the academic achievement of secondary school biology students in Awka education Zone, Anambra State.

Research Questions

The following research questions guided the study

1. To what extent does emotional intelligence predict secondary school students' academic achievement in biology?
2. To what extent does male secondary school students' emotional intelligence predict their academic achievement in biology?

3. To what extent does female secondary school students' emotional intelligence predict their academic achievement in biology?

Hypotheses

The following hypotheses were tested at 0.05 level of significance.

1. Emotional intelligence does not significantly predict secondary school students' academic achievement in biology.
2. Male secondary school students' emotional intelligence does not significantly predict their academic achievement in biology.
3. Female secondary school students' emotional intelligence does not significantly predict their academic achievement in biology.

Methods

The study adopted the predictive correlational research design. The area of this study was Awka Education Zone in Anambra State. The population of the study consists all 4,421 senior secondary two (SS2) (2,632 female and 1,789 male) students offering Biology in Awka Education zone. 240 biology SS2 students were sampled for the study using simple random sampling which represents 10% of the population. A standardized Emotional Intelligence Questionnaire (EIQ) adapted from Mayer, Salovey, and Caruso (2004) Emotional Intelligence Test (MSCEIT) was used to collect data. The instrument was validated by two experts from measurement and evaluation unit and biology education and a reliability index of 0.82 was obtained. Direct delivery method was used to collect data. Simple linear regression was used to answer the research questions while ANOVA was used to test the null hypotheses at 0.05 level of significance.

Results

Table 1: Prediction of Students' Achievement in Biology by Emotional Intelligence

Model	R	R ²	Adjusted R ²	Unstandardized coefficients (b)	Std. Error
Constant				63.382	
EI	.110 ^a	.012	.008	.116	13.188

a. Predictors: (Constant), Emotional Intelligence

Table 1 shows that a low positive relationship ($R = 0.110$) exists between secondary school students' EI and their achievement in biology. The R-Square value of 0.012 indicates that 1.2 percent of the variance in

biology scores is predicted by emotional intelligence. Again, a unit rise in EI increases students' achievement score in biology by 0.116.

Table 2: Prediction of Male Students' Achievement in Biology by their Emotional Intelligence

Model	R	R ²	Adjusted R ²	Unstandardized coefficients (b)	Std. Error
Constant				40.177	
EI	.166 ^a	.027	.020	.189	12.718

a. Predictors: (Constant), Male Emotional Intelligence

Table 2 shows that a low positive relationship ($R = 0.166$) exists between male secondary school students' EI and their achievement in biology. The R-Square value of 0.027 indicates that 2.7 percent of the variance in male students' biology scores is predicted by their emotional intelligence. Again, a unit rise in EI of Male students increases their achievement score in biology by 0.189.

Table 3: Prediction of Female Students' Achievement in Biology by their Emotional Intelligence

Model	R	R ²	Adjusted R ²	Unstandardized coefficients (b)	Std. Error
Constant				56.487	
EI	.136 ^a	.018	.009	.157	13.987

a. Predictors: (Constant), Female Emotional Intelligence

Table 3 shows that a low positive relationship ($R = 0.136$) exists between female secondary school students' EI and their achievement in biology. The R-Square value of 0.018 indicates that 1.8 percent of the variance in male students' biology scores is predicted by their emotional intelligence. Again, a unit rise in EI of female students increases their achievement score in biology by 0.157.

Table 4: ANOVA on Significance of Prediction of Achievement in Biology by Students' Emotional Intelligence

Model	Sum of Squares	df	Mean Square	F	Pvalue
Regression	511.580	1	511.580		
Residual	41396.820	238	173.936	2.941	.008b
Total	41908.400	239			

a Dependent Variable: Achievement. b. Predictors: (Constant), Emotional Intelligence

Table 4 shows that emotional intelligence significantly predicts achievement scores in biology $F(1, 238) = 2.941$, $p < 0.05$. The null hypothesis was therefore rejected implying that emotional intelligence significantly predicts secondary school students' academic achievement in biology.

Table 5: ANOVA on Significance of Prediction of Male Students' Achievement in Biology by their Emotional Intelligence

Model	Sum of Squares	df	Mean Square	F	Pvalue
Regression	583.153	1	583.153		
Residual	20702.354	128	161.737	3.606	.040 ^b
Total	21285.508	129			

a. Dependent Variable: Male Achievement. b. Predictor (constant) Emotional Intelligence

Table 5 shows that male students' emotional intelligence significantly predicts their achievement scores in biology $F(1, 128) = 3.606$, $p < 0.05$. The null hypothesis was therefore rejected implying that male secondary school students' emotional intelligence significantly predicts their academic achievement in biology.

Table 6: ANOVA on Significance of Prediction of Female Students' Achievement in Biology by their Emotional Intelligence

Model	Sum of Squares	df	Mean Square	F	Pvalue
-------	----------------	----	-------------	---	--------

Regression	398.070	1	398.070		
Residual	21129.103	108	195.640	2.035	.018 ^b
Total	21527.173	109			

a. Dependent Variable: Female Achievement. b. Predictor (constant) Female Emotional Intelligence

Table 6 shows that female students' emotional intelligence significantly predicts achievement scores in biology $F(1, 108) = 2.035$, $p < 0.05$. The null hypothesis was therefore rejected implying that female secondary school students' emotional intelligence does not significantly predict their academic achievement in biology.

Discussion

The findings of the study showed that emotional intelligence significantly predicted secondary school students' academic achievement in biology. The observed result of the study can be attributed to the fact that EI enabled students to recognize their own emotions enabling them to guide their thinking, avoid test anxiety and cope with academic situations. This ability to adapt to emotional changes even of their fellow students, properly disposed them with the sound mind required to maximize academic achievement. EI enable students to control thoughts that incite negative emotional disposition and behavior and to avoid mood swings leading to joyful participation in biology academic activities that in turn resulted in a good academic performance. The findings of the study are in line with the findings of Bar-On (2018) that there is positive relationship between emotional intelligence and academic performance and that EI significant predicted academic achievement of students in mathematics. The findings of the study also lend credence to the findings of Ms-Ramana (2018) that a positive predictive relationship exists between EI and academic achievement of students.

The findings of the study showed that the emotional intelligence of both male and female students significantly predicted their academic achievement in biology. The ability to regulate emotion for the best interest of the student lies with both male and female students and when they use such ability, they are able to easily interact with their peers over learning materials and contents. This interaction is a result of knowing when to meet to study without entertaining the emotions of shame over what is not known or learnt. Male and female students could understand each other's emotions and adjust their behavior as well to ensure best and effective inter and intrapersonal interactions that is in the best interest of their academic achievement. The findings of the study contradict the

findings of Adeyemo (2016) that female secondary school teachers were more emotionally intelligent and professionally developed than male secondary school teachers. The findings of Aghdasi, Kiamanesh, and Ebrahim, (2011) also do not support the findings of the present study when it reported that Gender difference on Emotional Quotient Inventory reveals that Males have high emotional intelligence as compare to females. The findings of the study however support the findings of Maryam and Reza (2017) that there were no significant differences between the genders on their total score measuring emotional intelligence.

Conclusion

The findings of the study showed that emotional intelligence significantly predicted the academic achievement of students in biology and also for male and female students. The conclusion that can be drawn from the finding of the study is that emotional intelligence plays a significant role in students' achievement in biology as it affect their learning disposition to biology activities in and outside the classroom.

Recommendations

The following recommendations are made based on the findings of the study:

1. School counselors should check on students' emotional intelligence level and develop orientation programs that could help them improve on the level of their emotional intelligence.
2. Secondary school teachers should model proper emotional intelligence and take time to identify those with low emotional intelligence and send them to the school counselors.

References

- Adeyemo, D. A. (2016). Demographic characteristics and emotional intelligence among workers in some selected organizations in Oyo State, Nigeria, Vision. *The Journal of Business Perspective*, 12(1)
- Aghdasi, S., Kiamanesh, A.R. & Ebrahim, A.N. (2011), "Emotional intelligence and organizational commitment: testing the mediatory role of occupational stress and job



- satisfaction”, *ProcediaSocial and Behavioral Sciences*, (29). 1965-1976.
- Ahmed, U., & Shah, S.M.M. (2017). Engaging PhD students: Investigating the role of supervisor support and psychological capital in a mediated Model. *Iranian journal of management studies*, 10 (2), 283-306.
- Akunwa, L.I. & Obidiwe J.B.C. (2013). *Modern biology for senior secondary schools*. Onitsha: Africana First Publishers.
- Bar-On, R. (2018). *EQ-i. Bar-On emotional quotient inventory, technical manual*. Toronto, Canada: Multi-Health Systems.
- Federal Republic of Nigeria (2020). *National policy on education*. Lagos: NERDC press.
- Joe, S., Melinda-Smith, M.A., Lawrence, R. & Jennifer, S. (2014). Improving emotional Intelligence (EQ). Retrieved from <https://www.helpguide.org>articles>.
- Maryam, A. M. (2017). *A New Perspective on Women’s biology Achievement*, *Psychological Bulletin*, (105), 198-214.
- MS-Ramama, V.D. (2018). Emotional intelligence and academic achievement of elementary pupils in mathematics of Batangas state university, ARASOF Nasugbu, Batangas: Input to a proposed development plan. *International Research Conference on Higher Education*, (4), 862- 878.
- Shubin, K. (2021). Emotional intelligence theory of Daniel Goleman’s, concept of EI, origin of EI, characteristics of EI. Retrieved from <https://www.linkedin.com>Pulse.theatre>, University of Ibadan.
- Spinath, B. (2012). Academic achievement. In Vilanayur S. Ramachandran (Ed) *Encyclopedia of human behaviour*, (pp. 1–8). San Diego, CA: Academic Press.