

**RELATIONSHIP BETWEEN EMOTIONAL INTELLIGENCE, ACADEMIC
SELF EFFICACY AND ACADEMIC ACHIEVEMENT AMONG SENIOR
SECONDARY SCHOOL BIOLOGY STUDENTS IN BOSSO LOCAL
GOVERNMENT AREA, NIGER STATE.**

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Abstract

This study examines the relationship between emotional intelligence, academic self-efficacy and academic achievement among Senior Secondary Biology students in Bosso Local Area Niger State. Four research objectives, four research questions and two corresponding research hypotheses guided the study. This study adopted a correlational research design. The population of the study comprised 3,929 Senior Secondary School (SS2) Biology students enrolled in the 2025/2026 academic session across sixteen (16) schools in Bosso Local Government Area. The sample size for the study comprises of three hundred and sixty five (365) SSII Biology students in Bosso Local Government area. The schools and students were selected using a simple random sampling technique through table of random numbers. Emotional Intelligence Questionnaire (EIQ), Self-Efficacy Questionnaire (SEQ) and Biology Achievement Test (BAT) were used to collect data. The validity of all the instruments were established by four experts in the field of Biology education, test and measurement and psychology from the department of science education in Federal University of Technology Minna. Internal consistency reliability of the EIQ and SEQ were established, the indices were calculated using Cronbach's Alpha reliability formula and found to be 0.84 and 0.87 respectively. Test- retest was conducted for Biology Achievement Test (BAT) and the index was found to be 0.81 calculated using PPMC. The data collected were analyzed using both descriptive of Mean, standard deviation, and simple scatter plot to answer research question. Similarly, Pearson product moment coefficient was used to test the hypotheses at 0.05 level of significance. The results indicated that Senior Secondary Biology Students, possess a generally high level of emotional intelligence and self-efficacy and showed that there was a very weak positive relationship between emotional intelligence, academic self-efficacy and academic achievement. It was concluded that there is no significant relationship between emotional intelligence, self-efficacy and academic achievement in secondary school biology students in Bosso local government, Niger state. It was recommended among others that schools should provide targeted orientation programmes that develop students' emotional intelligence and adequate academic competencies in learners.

Key Words: Emotional Intelligence, Academic Self Efficacy, Academic Achievement and Biology Students

Introduction

Science education is the process of imparting knowledge, skills, and attitudes related to the scientific understanding of the natural world, aimed at fostering critical thinking and problem-solving abilities in learners (Saifullahi *et al.*, 2024; Chado *et al.*, 2024; Smith & Johnson, 2021). It encompasses both formal instruction in schools and informal learning

experiences that encourage inquiry and exploration. Building on this foundation, effective science education not only delivers content knowledge but also promotes scientific literacy, enabling students to apply scientific principles in everyday life and make informed decisions (Bunkure & Saifullahi, 2021). This dual focus ensures that learners are equipped to navigate and contribute to an increasingly complex and technology-driven society (Lee, 2022).

Biology as one of the major science subjects taught in secondary and tertiary level of education is concerned with the biotic and abiotic components in the natural world. Obialor, *et al.* (2020) defined Biology as a science subject which describes how living organisms carry out their life activities and how they interact with their environment. Onu *et al.* (2020) view Biology as a natural science which studies the existence (evolution, morphology and physiology) of living things as well as their interactions with the non-living components of the earth. The inclusion of Biology by the Federal Government of Nigeria into the curriculum as a science related subject in Nigerian senior secondary schools offers the students' the opportunity to gain knowledge and skills related to the natural world.

Academic achievement, often measured by students' performance in examinations and assessments, is a key indicator of educational success and effectiveness. It reflects not only cognitive abilities but also the influence of various psychological and environmental factors that shape learning outcomes (Schunk & DiBenedetto, 2020). Academic achievement of students in an educational institution is one of the avenues of measuring the provision of qualitative education in educational institutions. Student's academic achievement is the knowledge gained by students' during a stipulated learning period for a given group of educational subjects studied in a semester, session or academic year.

Senior secondary school students may experience various academic and social pressures that can affect their emotional functioning and engagement with school activities. These experiences make it important to examine emotional intelligence among Biology students and to determine whether differences in emotional intelligence are associated with academic achievement. Emotional intelligences otherwise known as emotional quotient (EQ) is the ability to identify one's own emotions, control them, understand others emotion and manage social interactions. Fadahunsi *et al.* (2025). It encompasses key components such as self-awareness, self-regulation, motivation, empathy, and social skills. Today, unlike in the past, most of the Nigerians senior secondary school students are vulnerable to emotional dis-regulation because of some certain factors as teacher method of teaching, punitive punishment, overcrowded in the classroom, some challenges from the peers as well as other societal pressures that individuals are facing. In these prevailing societal pressures senior secondary school Biology student Bosso Local Government Area are not exception to the same challenges that may hinder them to perform better in their academics.

Emotional intelligence refers to an individual's ability to recognize, understand, regulate, and appropriately express emotions. It is considered an important psychological characteristic that may influence how students respond to academic demands and interact within the learning environment. Difficulties in managing emotions may affect students' ability to cope effectively with academic challenges and may consequently be associated with their academic achievement. However, the extent to which emotional intelligence is related to academic achievement among senior secondary school Biology students requires further investigation. Therefore, this study seeks to examine the relationship

between emotional intelligence and academic achievement among senior secondary school Biology students, as well as the relationship between academic self-efficacy and academic achievement.

Academic self-efficacy originated from social cognitive theory which validated a significant interaction between individual, environment, behavior and cognitive factors. It is a central component of social cognitive theory, whereby students with higher self-efficacy perform better academically, as self-confidence directly impacts academic achievement. In recent times, investigations in psychology of learning have linked the fluctuating academic achievement to low students self-efficacy in their subjects of study (Meng & Zhang, 2023). Thus, it has been identified as yet another factor for the recurrent menace, especially in science subjects such as biology. Students who have a strong belief in their abilities and who display a high level of academic self-efficacy are more likely to excel academically.

These psychological characteristics of students (emotional intelligence, and academic self-efficacy) may also interact in a number of ways to influence students' academic achievement. Studies are not replete with how the combination of these psychological traits may affect achievement, thus, the need for the present study which seeks to establish the joint prediction of these variables on achievement. The researcher is poised to conduct this investigation because a student may have high intelligence quotient and be academically brilliant but with the onset of low emotional intelligence, academic achievement may be drastically affected. The issue is further complicated by the fact that negative academic achievement may result in low self-esteem and then degenerate further into low academic self-efficacy. To understand how these factors may interact and influence students' performance necessities the need for this study.

Statement of the Problem

Biology education plays a crucial role in national development, particularly in fostering scientific literacy, critical thinking, and problem-solving skills among students. At the senior secondary school level, Biology is a core science subject that prepares learners for careers in medicine, agriculture, and other science-related fields. However, despite the recognized importance, students' academic achievement in Biology has remained inconsistent and below expectation in Nigerian secondary schools. Students are expected to possess high level of emotional intelligence to help them manage emotions, cope with academic stress, and maintain positive interpersonal relationships in the learning environment. In addition, they are expected to demonstrate strong self-efficacy, reflected in confidence in their academic abilities, persistence in the face of challenges, and motivation to succeed.

Students' poor achievement and negative attitude towards Biology have been major concerns for educators and policymakers. Reports from examination bodies such as the West African Examinations Council (WAEC) indicate a consistent decline in students' performance in Biology over the years (WAEC, 2022). These challenges manifest in poor classroom participation, examination anxiety, and unsatisfactory academic performance. Recent studies have also confirmed that variations in emotional intelligence significantly affect students' academic performance, with lower emotional intelligence associated with poorer outcomes (Adubale & Obioma, 2025) Similarly, inadequate academic self-efficacy has been linked to reduced motivation and weaker academic achievement among secondary school students This indicates a gap between the expected psychological competencies of students and the realities observed in the school system, hence the need

for this study to examine the level of emotional intelligence and self-efficacy among senior secondary school biology students in Bosso local government and their effect on academic achievement.

Objectives of the Study

The main aims of this study is to investigate the relationship between emotional intelligence, academic self-efficacy and academic achievement among senior secondary school students in Bosso Local Government Area of Minna, Niger state. The specific objectives are set to:

1. determine the level of emotional intelligence among senior secondary school Biology students in Bosso local government area.
2. determine the level of academic self-efficacy among senior secondary school biology students in Bosso Local Government Area.
3. examine the relationship between emotional intelligence and academic achievement among senior secondary school biology students in Bosso local Government Area.
4. find out the relationship between academic self-efficacy and academic achievement among senior secondary school Biology students in Bosso Local Government Area.

Research Questions

The following research questions were raised to guide this research:

1. What is the level of emotional intelligence among senior secondary school biology students in Bosso Local Government Area
2. What is the level of academic self-efficacy among senior secondary school Biology students in Bosso Local Government Area
3. What is the relationship between emotional intelligence and academic achievement among senior secondary school Biology students in Bosso Local Government Area
4. What is the relationship between academic self-efficacy and academic achievement among senior secondary school Biology students in Bosso Local Government Area

Research Hypotheses

Based on the stated research questions, the following hypotheses were formulated and tested at 0.05 significance level:

- H0₁:** There is no significant relationship between emotional intelligence and academic achievement among senior secondary school Biology students in Bosso local Government Area.
- H0₂:** There is no significant relationship between academic self-efficacy and academic achievement among senior secondary school Biology students in Bosso local Government Area.

Methodology

This study adopted a correlational research design. The population of the study comprised 3,929 Senior Secondary School (SS2) Biology students enrolled in the 2025/2026 academic session across sixteen (16) schools in Bosso Local Government Area. 2,135 are

male students while 1,794 are female students. The sample size for the study comprises of three hundred and sixty five (365) senior secondary school two (SSII) Biology students in Bosso Local Government area. The schools and students were selected using a simple random sampling techniques through table of random numbers. Emotional Intelligence Questionnaire (EIQ), Academic Self-Efficacy Questionnaire (ASEQ) and Biology Achievement Test (BAT). The EIQ measures various dimensions of emotional intelligence such as self-regulation, self-awareness, motivation, empathy and social skills and ASEQ assess students' academic self-efficacy. Each instrument is made up two (2) sections as follows; Demographic information section (A) that consist of respondents' bio-data while sections (B) ten (10) items structured using a four point modified Likert scale of strongly agree = 4, Agree = 3, Disagree = 2, strongly disagree=1 for the EIQ and ASEQ while BAT consist of twenty five (25) multiple choice items. The validity of all the instruments was established by four experts in the field Biology education, test and measurement and psychology from the department of science education in Federal University of Technology Minna. Internal consistency reliability of the EIQ and ASEQ were established, the indices were calculated using Cronbach's Alpha reliability formula and found to be 0.84 and 0.87 respectively. Test- retest was conducted for Biology Achievement Test (BAT) and the index was found to be 0.81 calculated using Pearson product moment coefficient. The data collected were analyzed using both descriptive of Mean and standard deviation to answer research question one and two, while simple scatter plot was used to answer research question three and four. Similarly, Pearson product moment coefficient was used to test the hypotheses at 0.05 level of significance.

Research Question One: What is the level of Emotional Intelligence among senior secondary school II Biology students in Bosso Local Government?

To answer this research question, mean and standard deviation were used to describe the level of EI among secondary school biology students, as indicated in Table 1.

Table 1: Mean and Standard Deviation of Emotional Intelligence Rating of students.

S/N	Items	N	Mea n	SD	Decisio n
1	I understand my feelings and how they affect my behavior	365	3.12	0.92	Agree
2	I remain calm and controlled in stressful situations	365	3.01	0.81	Agree
3	I am able to motivate myself to accomplish tasks even when faced with obstacles	365	2.99	0.80	Agree
4	I manage interpersonal relationships effectively	365	3.09	0.85	Agree
5	I handle criticism well without getting offensive or upsetting	365	3.19	0.84	Agree
6	I manage stress effectively during examinations	365	2.95	0.86	Agree
7	I empathize with others in difficult situations	365	2.92	0.93	Agree
8	I pay attention when others express their feelings	365	3.11	1.00	Agree
9	I remain optimistic even when things do not go as planned	365	2.91	0.94	Agree
10	I have the ability to empathize with others in difficult situations.	365	2.86	0.88	Agree
	TOTAL	365	3.02	0.88	Agree

Table 1 presented the Mean and Standard Deviation of Emotional Intelligence Rating of secondary school Biology students in Bosso Local Government, Niger state. The results shows that all the ten items recorded mean scores above the decision mean of 2.50, where item 5 recorded the highest mean score of 3.19 with a standard deviation of 0.839, followed by item 1 with a mean of 3.12 and standard deviation of 0.921. Item 8 recorded a mean score of 3.11 with a standard deviation of 1.00, while item 4 had a mean score of 3.09 and standard deviation of 0.847. The lowest mean score was recorded by item 10, with a mean of 2.86 and standard deviation of 0.881. Despite having the lowest mean, the score remained above the benchmark mean of 2.50. The grand mean of 3.02 indicates a high level of emotional intelligence among the respondents. The standard deviation values show some variation in the respondents' responses across the items. However, most individual items scores are "Agreed" upon by respondents, particularly in areas such as self-regulation of emotions (3.19), Self-awareness (3.12) and empathy (3.11). However the ability to empathize with other in difficult situations is notably low (2.86), suggesting a potential area for improvement. Other items like managing interpersonal relationships (3.09) and remaining calm and controlled in stressful situations also reflect a need for development despite overall high scores in several emotional intelligence components.

Research Question Two: What is the level of academic self-efficacy among Senior Secondary Biology Students in Bosso Local Government Area, Niger State?

To answer this research question, mean and standard deviation were used to describe the level of academic self-efficacy among senior secondary school biology students, as indicated in Table 2

Table 2: Mean and Standard Deviation of Academic Self-Efficacy Rating of Students.

SN	Items	N	Mean	SD	Decision
1	I believe that I will perform well in Biology.	365	3.23	.768	Agree
2	I can understand difficult Biology concepts.	365	3.07	.782	Agree
3	I can complete Biology assignments on time.	365	2.95	.719	Agree
4	I continue studying even when Biology topics are difficult.	365	2.72	.944	Agree
5	I can achieve the academic goals set for myself.	365	2.74	.908	Agree
6	I can overcome challenges encountered while studying Biology.	365	2.85	1.002	Agree
7	I believe that hard work will improve my Biology performance.	365	2.86	.911	Agree
8	I learn Biology effectively without close supervision.	365	2.84	.861	Agree
9	I can organize my study time effectively.	365	2.62	.975	Agree
10	I can successfully complete difficult Biology assignments.	365	2.46	.954	Disagree
	TOTAL		2.83	0.88	

The analysis of academic self-efficacy among secondary school students in Bosso local government indicates a high capacity for various academic self-efficacy. The results indicate that nine out of the ten items recorded mean scores above the benchmark mean of 2.50. The mean scores ranged from 2.46 to 3.23, where SE1 recorded the highest mean score of 3.23 with a standard deviation of 0.768, followed by SE2 with a mean of 3.07 and standard deviation of 0.782. SE3 recorded a mean of 2.95, while SE7 had a mean of 2.86. SE10 recorded the lowest mean score of 2.46 with a standard deviation of 0.954, therefore not agreed upon. The overall mean score of 2.83 indicates that the respondents generally reported a relatively high level of academic self-efficacy. Although one item recorded a mean slightly below the benchmark, the majority of the items were above the benchmark mean. This suggests that the respondents generally had confidence in their academic abilities and their capacity to perform academic tasks.

Research question three: What is the relationship between Emotional Intelligence and Academic Achievement among secondary school biology students in Bosso local government?

To answer this research question, scatter plot was used to highlight the relationship between emotional intelligence and academic achievement as presented in figure 1

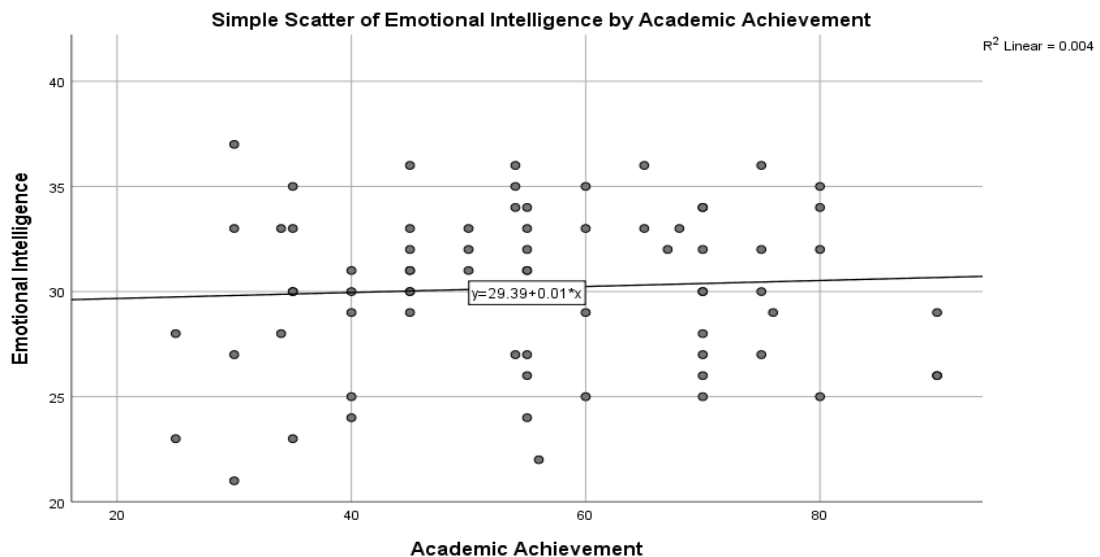


Figure 1: Simple scatter plot of Emotional intelligence and Academic achievement of senior secondary school biology students.

Figure 1 shows the relationship between emotional intelligence and academic achievement among Senior Secondary Biology students in Bosso Local Government Area. The scatter plot indicates a weak positive relationship between emotional intelligence and academic achievement. The upward direction of the regression line suggests that higher levels of emotional intelligence are associated with higher academic achievement. The R^2 value of 0.004 indicates that emotional intelligence accounts for approximately 0.4% of the variation in academic achievement, indicating a very weak linear relationship between the two variables.

Research Question Four: What's the relationship between Academic self-efficacy and Academic Achievement among secondary school Biology students in Bosso local government Niger state?

To answer research question, scatter plot was used to describe the level of Academic self-efficacy and secondary school Biology students, as indicated in Figure 2

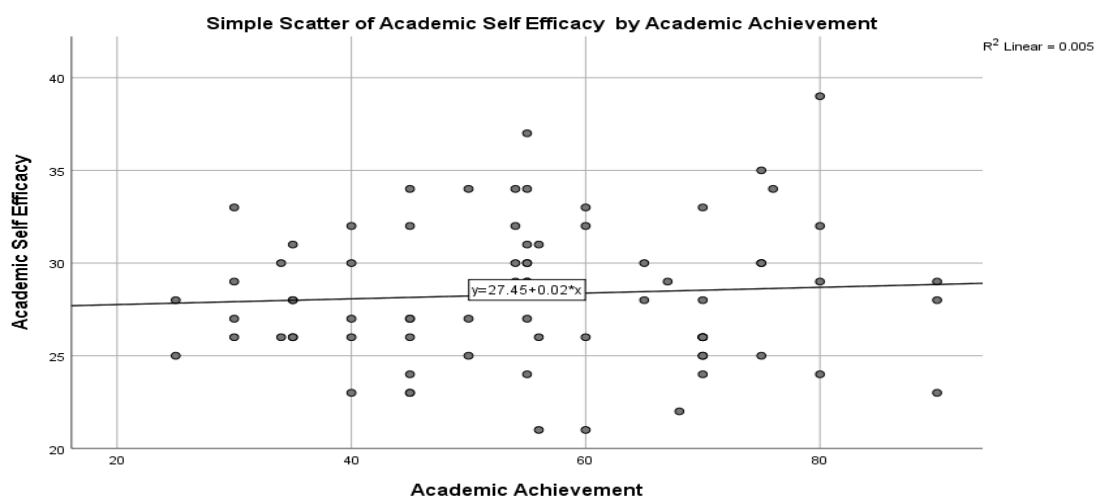


Figure 2 Simple scatter plot of Academic self-efficacy and Academic achievement of senior secondary school Biology students

Figure 2 shows the relationship between academic self-efficacy and academic achievement among Senior Secondary Biology students in Bosso Local Government Area. The scatter plot indicates a weak positive relationship between academic self-efficacy and academic achievement. The upward direction of the regression line suggests that higher levels of academic self-efficacy are associated with higher academic achievement. The R^2 value of 0.005 indicates that academic self-efficacy accounts for approximately 0.5% of the variation in academic achievement, indicating a very weak linear relationship between the two variables.

H₀₁: There is no significant relationship between emotional intelligence and academic achievement among Senior Secondary Biology Students in Bosso Local Government Area, Niger State.

Table 3: Relationships between Emotional Intelligence and Academic Achievement

	Correlations	Emotional Intelligence	Academic Achievement
Emotional Intelligence	Pearson Correlation	1	.063
	Sig. (2-tailed)		.594
	N	365	365
Academic Achievement	Pearson Correlation	.063	1
	Sig. (2-tailed)	.594	
	N	365	365

Table 3 shows the relationships between Emotional Intelligence and Academic Achievement among Senior Secondary Biology Students in Bosso Local Government Area, Niger State. The results indicates that there was a weak non-significant correlation

between emotional intelligence and academic achievement ($r = 0.063$, $p = 0.594$). It was therefore concluded that, the null hypothesis 1 is hereby accepted.

H₀₂: There is no significant relationship between academic self-efficacy and academic achievement among Senior Secondary Biology Students in Bosso Local Government Area, Niger State.

Table 4 Relationships between Academic Self efficacy and Academic Achievement

Correlations		Academic Achievement	Academic Self Efficacy
Academic Achievement	Pearson	1	.068
	Correlation		
	Sig. (2-tailed)		.565
	N	365	365
Academic Self Efficacy	Pearson	.068	1
	Correlation		
	Sig. (2-tailed)	.565	
	N	365	365

Table 4 shows the relationships between Academic Self-efficacy and Academic Achievement among Senior Secondary Biology Students in Bosso Local Government Area, Niger State. The results indicates that there was a weak non-significant correlation between academic self-efficacy and academic achievement ($r = 0.068$, $p = 0.565$). It was therefore concluded that, the null hypothesis 2 is hereby accepted.

Discussion of Findings

The finding of the study revealed that Senior Secondary Biology students in Bosso Local Government Area, Niger State, had a high level of emotional intelligence. This finding indicates that the students generally demonstrated a relatively high level of emotional intelligence based on the areas assessed by the instrument used in the study. The finding suggests that emotional intelligence was present at a considerable level among the Biology students studied. This finding is consistent with the study of Ogbonnaya *et al.* (2024), which examined emotional intelligence and academic performance among senior secondary school Biology students in Ogun State and also reported a high level of emotional intelligence among the students. The similarity between the two findings is notable because both studies focused on senior secondary school Biology students within the Nigerian educational context, although they were conducted in different geographical locations. The present finding therefore adds to existing evidence that senior secondary school Biology students may demonstrate relatively high levels of emotional intelligence when assessed using an appropriate emotional intelligence measure.

The finding of the study revealed that Senior Secondary Biology students in Bosso Local Government Area, Niger State, had a high level of academic self-efficacy. This finding indicates that the students generally had a strong belief in their ability to perform academic tasks and cope with the demands of their studies, as reflected in their responses to the academic self-efficacy measure. The finding is in agreement with Ozuome *et al.* (2024), who reported that a good number of secondary school students in Imo State demonstrated a high level of academic self-efficacy. The agreement between the two studies is evident in the high level of academic self-efficacy reported among secondary

school students in both studies. Although the studies were conducted in different states, both examined academic self-efficacy among secondary school students in Nigeria. The present finding therefore provides further evidence of the presence of a relatively high level of academic self-efficacy among secondary school students in the Nigerian educational context.

The findings of this study revealed that there is a very weak positive and non-significant relationship between emotional intelligence and academic achievement among Senior Secondary Biology Students in Bosso Local Government Area. The findings align with the study of Obialor *et al.* (2024), who investigated emotional intelligence and academic achievement in Biology among SSII students in Awka South Education Zone and found low positive relationship between emotional intelligence and academic achievement in Biology. The present finding did not align with the finding of Ojewola (2022), who reported a significant relationship between emotional intelligence and academic achievement among secondary school students in Ogbomosho Metropolis, and this is due to the fact that academic achievement is influenced by several factors apart from emotional intelligence.

The findings of this study revealed that there was a very weak positive and non-significant relationship between academic self-efficacy and academic achievement among Senior Secondary Biology Students in Bosso Local Government Area. The findings contradict the work of Nwadinobsi *et al.* (2023), who examined academic self-efficacy and academic procrastination as correlates of secondary school students' academic achievement in Anambra State and found significant relationship between academic self-efficacy and academic achievement. The possible reason may be traced to the fact that academic achievement is a multidimensional outcome that depends on several interacting factors. A student may believe strongly in his or her academic ability but still perform poorly because of inadequate study time, ineffective study strategies, poor learning resources, examination anxiety, teaching-related factors or other environmental circumstances.

Recommendations

Based on the findings and discussions, the following recommendations are proposed:

1. Biology teachers should continue to provide supportive classroom environments that allow students to develop and express emotional skills, although such development should not be presented as a direct means of improving academic achievement.
2. Schools should provide appropriate guidance and counselling programmes that can support students' emotional well-being and academic self-efficacy as part of their overall educational development.
3. Teachers should use varied and learner-centered teaching strategies to support students' academic achievement, rather than relying on emotional intelligence or academic self-efficacy alone as determinants of achievement
4. Further studies should investigate other factors that may be associated with students' academic achievement, since the present study found no significant relationship between emotional intelligence, academic self-efficacy, and academic achievement.

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