

## **INFLUENCE OF EMOTIONAL INTELLIGENCE ON ACADEMIC PERFORMANCE OF SENIOR SECONDARY SCHOOL BIOLOGY STUDENTS IN OGUN STATE**

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### **Abstract**

*Emotional intelligence refers to an individual's capacity to perceive, comprehend, regulate, and appropriately apply emotions in both personal and interpersonal contexts, encompassing core dimensions such as self-awareness, self-control, motivation, empathy, and social competence. The performance of students in biology, is impacted by various critical factor, including emotional intelligence. This study examined the influence of emotional intelligence on academic performance of senior secondary school biology students in Ogun State. A correlational design was employed, and the population of the study consisted of all senior secondary school students studying biology in the Ijebu Educational Division of Ogun State. A randomly selected sample of 468 biology students from Ogun State public senior secondary schools made up the sample for the study. The Emotional Intelligence Scale which was validated by science education experts from the Biological Sciences Department, Tai Solarin Federal University of Education, Ijagun, Ogun State and which has reliability coefficient of 0.90 was adapted and utilized for data collection. Descriptive statistics (means, frequency counts, and percentages) and inferential statistics (t-test and Pearson Product Moment Correlation (PPMC) were used to analyze the data. The results revealed that the students demonstrated a high level of emotional intelligence as mean scale ranges from 44 to 130, with a midpoint value of 87 and mean scores exceeding the midpoint value of 87 were interpreted as high, whereas scores below 87 were classified as low (Mean = 100.57; Standard Deviation = 15.64). There was a significant gender difference in emotional intelligence of senior secondary school biology students ( $p < .05$ ), as well as a significant gender difference in academic performance of biology students ( $p < .05$ ). Finally, a weak but significant positive correlation between emotional intelligence and students' academic performance in biology was found ( $r = 0.213$ ,  $p < .05$ ). Based on these findings, it was concluded that students emotional intelligence level was high and it was therefore, recommended that students receive more support and guidance to continue developing and maintaining their high levels of emotional intelligence, which can lead to improved academic performance. Furthermore, structured school-based activities like cooperative learning and group projects aimed at sustaining students' emotional intelligence should be implemented to enhance academic performance.*

**Keywords:** Academic Performance, Biology Students, Emotional Intelligence, Senior Secondary School

### **Introduction**

Emotional intelligence involves understanding oneself, others, and the surrounding environment. It enables individuals to better adapt to changing situations and meet environmental demands. People who effectively utilize the Emotional Quotient inventory tend

to have greater awareness of their emotions and express them more effectively (Al-Qadri and Zhao, 2021). Emotional intelligence is a psychological concept that combines two elements: emotion and intelligence. Intelligence relates to the cognitive aspects of mental processes, such as thinking and reasoning, while emotions pertain to the affective aspects, including feelings and appreciation. In simple terms, intelligence is the acquisition, comprehension, and application of knowledge for problem-solving, whereas emotion refers to an individual's mood or emotional state (Mbaegbu *et al.*, 2023).

Emotional intelligence can be seen as the capacity of recognizing, understanding, and managing both the emotion of others and one's own emotions. This skill plays a crucial role across various life domains, particularly in education, where it can significantly impact student success and academic outcomes. Academic performance is a complex construct influenced by multiple factors, including cognitive abilities, motivation, self-regulation, and socio-emotional components (Korucu *et al.*, 2022). According to D'Amico (2018), emotional intelligence (EI) comprises four key domains: perception of emotions, facilitating cognitive processes with emotions, recognizing emotional dynamics, and emotion regulation. Emotional intelligence has attracted increasing scholarly interest in recent years due to its potential impacts on humans and academic achievement.

Academic performance is defined as the observable and measurable demonstration of students' proficiency in skills and subject matter, assessed through valid and reliable testing instruments (Mbaegbu *et al.*, 2023). Academic performance is when learning objectives are successfully attained by students (Ali *et al.*, 2013). It was further characterized in terms of success or failure in course units, including the number of courses passed or failed (Goldfinch & Hughes, 2013). Steinmayr *et al.*, (2014) described academic performance as outcomes that reflect the degree to which an individual has met specific objectives targeted within instructional settings, such as schools, colleges, and universities. They identify broad indicators of academic achievement, including procedural and declarative knowledge acquired through education, curriculum-based measures such as grades or scores on achievement tests, and cumulative indicators like educational degrees and certificates. Across diverse societies, whether developed or developing, in human lives, academic performance plays a significant role. In the context of Bangladesh, academic performance across educational systems is predominantly evaluated through general metrics such as grades or grade point averages (GPA) derived from various examinations and tests. Consequently, academic performance serves as a key determinant of an individual's ability to participate in and succeed within educational systems. Olufemi *et al.*, (2018) noted that students' academic performance is influenced by multiple factors, including learning skills, school environment, parental background, peer influence, teacher quality, availability of learning resources, and infrastructure, among others. Omoniyi *et al.*, (2022) described academic performance as the extent to which learners exhibit acquired knowledge and skills, typically quantified through examination scores or teacher assigned grades, thereby aligning closely with formal assessment practices used to evaluate student performance.

Numerous studies have investigated the association between academic performance and emotional intelligence, yielding inconsistent results. While some research has identified an association of emotional intelligence with academic performance, other studies have reported either no significant relationship or mixed findings. For example, Li (2020) and MacCann *et al.*, (2020) observed significant association of academic success with emotional intelligence of college students. Conversely, Herrera *et al.*, (2020) observed that the academic performance of students with lower grade point averages was predicted by emotional intelligence. In addition to Nigerian studies, several international studies particularly in Bangladesh have explored this relationship among university students. Fernández-Martínez *et al.*, (2019) showed

there was significant correlation of emotional intelligence with academic success. Similarly, Biswas *et al.*, (2019) in Bangladesh, reported that the university students' emotional intelligence predicted their academic performance. Additionally, Babajide and Amosu (2019) reported that academic performance of students in physics was influenced by emotional intelligence. Therefore, this study was undertaken to examine influence of emotional intelligence on academic performance of senior secondary school biology students in Ogun State.

### **Statement of the Problem**

The academic achievement of students is an important discussion in the society. Teachers, parents, government officials, curriculum planners, and developers are deeply concerned in the learning outcomes of students. They are happy when educational outcomes, particularly in biology examinations, are outcome-oriented and reflect success. However, the opposite is true when the results do not justify the effort invested, as evidenced by poor academic performance. Several factors can contribute to students' poor academic performance, including insufficient drive to strive for excellence and a lack of awareness of their emotional capabilities. The combination of these factors could either bring negative or positive impact on students' performance (Ogbonnaya *et al.*, 2023). This study will provide insights into the influence of emotional intelligence on the academic performance of senior secondary school biology students in Ogun State, helping educators and researchers to understand the role of emotional intelligence in students' academic performance. It will also offer practical implications for educators, policymakers, stakeholders and parents seeking to improve the emotional intelligence and academic performance of the students in biology. Hence, this study examined the influence of emotional intelligence on academic performance of senior secondary school biology students in Ogun State.

### **Aim and Objectives of the Study**

The aim of the study was to examine the influence of emotional intelligence on academic performance of senior secondary school biology students in Ogun State. Specifically, the objectives of the study were to:

1. assess the level of emotional intelligence among senior secondary school biology students in Ogun State.
2. investigate the significant gender difference in the emotional intelligence of senior secondary school biology students in Ogun State.
3. determine the significant gender difference in the academic performance of senior secondary school biology students in Ogun State
4. examine the significant relationship between emotional intelligence and academic performance of senior secondary school biology students in Ogun State.

### **Research Questions**

The following research questions were raised to guide the study:

1. What is the level of emotional intelligence among senior secondary school biology students in Ogun State?
2. Is there any significant gender difference in the emotional intelligence of senior secondary school biology students in Ogun State?
3. Is there any significant gender difference in the academic performance of senior secondary school biology students in Ogun State?
4. Is there any significant relationship between emotional intelligence and academic performance of senior secondary school biology students in Ogun State?

### **Research Hypotheses**

The following research hypotheses were tested:

1. There is no significant gender difference in the emotional intelligence of senior secondary school biology students in Ogun State.
2. There is no significant gender difference in the academic performance of senior secondary school biology students in Ogun State
3. There is no significant relationship between emotional intelligence and academic performance of senior secondary school biology students in Ogun State.

### **Methodology**

A correlational research design was adopted for this study. This design was selected because it allows for a comprehensive examination and deeper understanding of the relationship between emotional intelligence and academic performance. The population comprised all senior secondary school students offering Biology in the Ijebu Educational Division of Ogun State. Using a simple random sampling technique, 468 students were selected from the sampled schools. Data were collected using Schutte et al.'s (1998) Emotional Intelligence Scale, which was adapted and structured into three sections: demographic information, 33 items measuring emotional intelligence on a four-point Likert scale.

The instrument was validated by experts in science education from the Department of Biological Sciences, Tai Solarin Federal University of Education, and its reliability was established through a pilot study involving 50 students outside the main sample, yielding a Cronbach's alpha coefficient of 0.90 which shows that the research instrument is strongly reliable for the study. Five hundred questionnaires were administered, of which 468 were successfully retrieved, representing a 93.6% response rate. Students' academic performance data were obtained from Biology teachers in the selected schools. Data were analyzed using frequency counts, percentages, and means, t-tests and correlation.

### **Results**

**Table 1** Demographic Information of Participants

	<b>Frequency (F)</b>	<b>Percentage (%)</b>
<b>Gender</b>		
Male	248	53.0
Female	220	47.0
<b>Age</b>		
Less than 13 years	20	4.3
13-20 years	437	93.4
Above 20 years	11	2.4

Table 1 presents the demographics of the participants categorized by gender and age. Analysis of gender revealed that 248 respondents (53.0%) were male, while 220 respondents (47.0%) were female, indicating a majority of male participants. Age distribution showed that 20 respondents (4.3%) were under 13 years old, 437 respondents (93.4%) were between 13 and 20 years old, and 11 respondents (2.4%) were over 20 years old. The majority of respondents were within the 13–20-year age range.

**Research Question One:** What is the level of emotional intelligence among senior secondary

school biology students in Ogun State?

**Table 2: Level of Emotional Intelligence of Senior Secondary School Biology Students in Ogun State**

	<b>N</b>	<b>Minimum</b>	<b>Maximum</b>	<b>Midpoint</b>	<b>Mean</b>	<b>Std. Deviation</b>
<b>EMOTIONAL INTELLIGENCE</b>	468	44	130	87	100.57	15.64

**KEY:**

N- Total number of Participants;

**O- STD. DEVIATION-** Standard Deviation

The emotional intelligence level of biology students in senior secondary schools is presented in Table 2. Results indicate the minimum and maximum value of emotional intelligence ranged from 44 to 130 of which the calculated midpoint was found to be 87. Therefore, any mean value below 87 signifies a low level of emotional intelligence, while any mean value above 87 indicates a high level. The findings reveal that the emotional intelligence level of biology students in senior secondary schools was high (M = 100.57, SD = 15.64).

**Research Hypothesis One:** There is no significant gender difference in the emotional intelligence of senior secondary school biology students in Ogun State

**Table 3 Independent t-test of the Emotional Intelligence of Biology Students based on Gender**

	<b>Mean</b>	<b>N</b>	<b>SD</b>	<b>Mean Difference</b>	<b>SD Error</b>	<b>t</b>	<b>df</b>	<b>Sig</b>
<b>Male</b>	98.95	248	15.369	-3.453	1.441	-2.568	466	.017
<b>Female</b>	102.40	220	15.775	-3.453	1.443	-2.576	456.25	

**KEY:**

**N-** Total number of Participants; **SD-** Standard Deviation; **SD error-** Standard Deviation Error, **t-** calculated difference in units of standard error; **df-** Degrees of Freedom; **Sig-** Significance level

The table 3 presents mean scores of emotional intelligence for biology students based on gender. The mean scores for male and female biology students were 98.55 ± 15.37 and 102.40 ± 15.78, respectively. The results indicate that female biology students are more emotionally intelligent than their male counterparts. Furthermore, the independent samples t-test revealed a significant gender difference in emotional intelligence of biology students (p = .017).

**Research Hypothesis Two:** There is no significant gender difference in the academic performance of senior secondary school biology students in Ogun State

**Table 4: Independent t-test of the Academic Performance of Biology Students based on Gender**

	<b>Mean</b>	<b>N</b>	<b>SD</b>	<b>Mean Difference</b>	<b>SD error</b>	<b>T</b>	<b>df</b>	<b>Sig</b>
<b>Male</b>	51.23	236	14.613	-3.524	1.260	1.272	452	.006
<b>Female</b>	54.76	218	12.275	-3.524	1.301	1.263	448.02	

**KEY:** **N-** Total number of Participants; **SD-** Standard Deviation; **SD error-** Standard Deviation Error, **t-** calculated difference in units of standard error; **df-** Degrees of Freedom;

**Sig-** Significance level.

Table 4 presents the mean scores of the academic performance biology students based on gender. Male and female biology students had the means scores of  $51.23 \pm 14.61$  and  $54.76 \pm 12.28$ , respectively. The results indicate that male biology students performed lesser than their female counterparts. Furthermore, the independent samples t-test revealed a significant difference in the biology students' academic performance based on gender ( $p = .006$ ).

**Research Hypothesis Three:** There is no significant relationship between emotional intelligence and academic performance of senior secondary school biology students in Ogun State.

**Table 5: Correlation between Emotional Intelligence and Academic Performance Senior Secondary School Biology Students in Ogun State**

		EI	AP
<b>EI</b>	Pearson Correlation	1	.213**
	Sig. (2-tailed)		.000
	N	468	454
<b>AP</b>	Pearson Correlation	.213**	1
	Sig. (2-tailed)	.000	
	N	454	454

**\*\*.** Correlation is significant at the 0.01 level (2-tailed).

**KEY:** **EI-** Emotional Intelligence; **AP-** Academic Performance

The correlation of emotional intelligence with academic performance of biology students is presented in Table 5. A weak but statistically significant relationship was found between emotional intelligence and academic performance of these biology students, when analyzed using Pearson's correlation ( $r = .213^{**}$ ,  $p = .000$ ).

### Discussion

This research examined the influence of emotional intelligence on academic performance of senior secondary school biology students in Ogun State. The findings indicated that the emotional intelligence level of these students was high. Data analysis revealed a significant gender difference in emotional intelligence of biology students. Additionally, there was a significant gender difference in academic performance of the students. Finally, a weak but statistically significant relationship was found between emotional intelligence and biology students' academic performance.

This study indicated that the emotional intelligence level of senior secondary school biology students in Ogun State was high. The findings of Falade *et al.*, (2025), which showed that fresh health sciences undergraduates in Ondo State, Nigeria, demonstrated high emotional intelligence, corroborate these results. However, findings from this study do not align with those of Mahrous *et al.*, (2023), who reported that students recorded moderate overall scores for emotional intelligence. Similarly, Yulika *et al.*, (2019) revealed that most Indonesian students had moderate emotional intelligence, which also contrasts with our findings. The findings from this study revealed a significant difference in the emotional intelligence of male and female students studying biology in Ogun State. This is supported by Nasir *et al.* (2025), who reported a significant gender difference in students' emotional intelligence.

Furthermore, Patel (2017) found that girls exhibit stronger emotional intelligence, which aligns with our results. Similarly, Rahimi Domakani *et al.*, (2014) found that females possess greater overall emotional intelligence and excel in interpersonal skills, adaptability, and pragmatic knowledge compared to males. However, our findings are not supported by Britwum *et al.*, (2024), who reported no significant gender difference in students' emotional intelligence. Altwijri *et al.*, (2021) in Saudi Arabia also found there was no significant differences in emotional intelligence scores among male and female medical university students. Additionally, Ering and Sahoo (2023) reported there was no significant difference in the emotional intelligence of male and female postgraduate students in the Papum-Pare District of Arunachal Pradesh. Obialor *et al.* (2024) similarly found no significant gender difference in students' emotional intelligence. Furthermore, our results also contradict those of Ajmal *et al.*, (2017), Ali *et al.*, (2021), and Rao and Komala (2017), who reported that female students reported lesser emotional intelligence scores compared to their male counterparts.

The result of this study also revealed a significant gender difference in the biology students' academic performance in Ogun State senior secondary schools, with female students outperforming their male counterparts. This finding aligns with a study conducted in Saudi Arabia, which also reported female students performing higher than their male counterparts (Alabdulkarem *et al.*, 2021). Similarly, Parajuli and Thapa (2017) found that female participants outperformed male participants academically. However, the findings of Ikwuka and Samuel (2017), which indicated that gender significantly influenced academic performance in favor of male students taught through computer animation (cartoon concept), contradict our results.

The results also showed a significant correlation between emotional intelligence and the academic performance of senior secondary school biology students in Ogun State. Our results are consistent with Obialor *et al.*, (2024), who found a weak positive correlation of biology students' academic achievement with their emotional intelligence. The study's results are consistent with those of Wijekoon *et al.*, (2017), who found a positive correlation of medical students' academic performance with emotional intelligence in Sri Lanka. Our study's results also support Dacillo's (2018) findings that there is a positive predictive association between emotional intelligence and the academic performance of students. Additionally, our findings is supported by Kanjo *et al.*, (2019), who showed there was a positive relationship between emotional intelligence and academic achievement. Fernández-Martínez *et al.*, (2019) reported a positive correlation between academic success and emotional intelligence. Li (2020); MacCann *et al.*, (2020) also observed a positive association between academic success and emotional intelligence among college students. Moreover, our results are not supported by Shah *et al.*, (2014), who found a negative relationship between academic achievement and emotional intelligence (EI) among Indian medical university students. Our results contrast with those of Rahimi (2016), and Yıldızbaş (2017), who showed there was no significant relationship between emotional intelligence and academic achievement.

## **Conclusion**

The findings from this research showed that the level of emotional intelligence of senior secondary school biology students in Ogun State was high level, implying that they possess a robust control and mastery of their emotions and skills that enables them to regulate their emotions. Moreover, there was significant difference in the emotional intelligence of male and female Ogun State senior secondary school biology students, revealing gender influenced the emotional intelligence of biology students based on the significant difference that existed.

Additionally, biology students' academic performance in Ogun State varied significantly by gender. This indicates that gender affects biology students' academic performance because the study found a statistically significant difference in biology students' academic performance

by gender. Students studying biology in the senior secondary school at Ogun State showed a strong correlation between their academic performance and their emotional intelligence. This suggests that biology students' academic performance is highly influenced by their emotional intelligence.

### **Recommendations**

Based on the findings of this study, it is therefore recommended that:

1. Students should receive additional support and guidance so they can continue to grow and sustain their high emotional intelligence, which will improve their academic performance.
2. Activities like cooperative learning and group projects that help students maintain their high level of emotional intelligence should be provided.
3. The biology curriculum should incorporate exercises that help the students develop their emotional intelligence.
4. Biology teachers should focus on developing students' emotional intelligence and not do things that will affect their emotions.

### **Conflict of Interest**

The authors declare that there is no conflict of interest

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