

EMOTIONAL INTELLIGENCE AS CORRELATE OF INTEREST AND ACADEMIC ACHIEVEMENT OF SENIOR SECONDARY SCHOOL STUDENTS IN MATHEMATICS IN ENUGU STATE

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ABSTRACT

*This study determined emotional intelligence as correlate of interest and academic achievement of senior secondary school students in mathematics in Enugu State. The researcher employed a **Correlational survey research design** for this study. The study focused on a **population of 2,946 Mathematics students**, from which a **sample of 294 students** was selected. A **stratified proportionate sampling technique** was used to ensure fair representation across different groups. Data were collected using a **researcher-designed questionnaire** titled “Emotional Intelligence as Correlates of Interest and Academic Achievement of Students in Mathematics Questionnaire (EICIAASMQ)”. To validate the instrument, the researcher consulted **three experts from Enugu State University of Science and Technology (ESUT)**: two from the Department of Educational Foundations and one from the Measurement and Evaluation unit of the Department of Mathematics and Computer Science Education. The **reliability of the questionnaire** was tested through a trial involving **20 students from public secondary schools in Anambra State**, and the **Cronbach’s Alpha method** was used to check internal consistency. The reliability coefficients for the four clusters were **0.79, 0.81, 0.80, and 0.82**, resulting in an overall reliability index of **0.80**, indicating that the instrument was suitable for the study. To analyze the data, the researcher applied **Pearson’s Product Moment Correlation Coefficient** to address the research questions and **linear regression** to test the hypotheses at a **0.05 level of significance**. The findings showed that there was a high relationship between emotional intelligence (self-awareness and self-regulation) and students’ interest and academic achievement of senior secondary school students in mathematics in Enugu State. In line with the findings, the study recommended that schools should embed self-awareness and self-regulation programs into mathematics teaching, helping students manage emotions and sustain interest in learning.*

Keywords: Emotional Intelligence, Self-Awareness, Self-Regulation, Student Interest, Academic Achievement.

Introduction

Education is one of the most important resources a society can provide to a child. It acts as a driver of change, helping individuals and communities achieve specific goals, which often requires reforms to ensure high academic standards (Entoh & Abdullah, 2019). Quality education is essential not only for personal growth but also for global development and freedom (Obiakor & Oguejioffor, 2020). Broadly, education includes any experience or activity that shapes a person's mind, character, or physical abilities (Parvaiz & Khalid, 2021). Improving educational quality is a worldwide priority, as it is closely linked to economic growth and national development (Bentil, 2021). Globally, education is viewed as an investment in human capital that contributes directly to a nation's wealth and development (Okochi, 2019). It is a dynamic process that imparts knowledge, sparks curiosity, fosters positive attitudes, and develops skills necessary for independent learning (Anbalangan, 2017). According to the Federal Republic of Nigeria (FRN, 2013), education is widely recognized as a tool for national transformation. Through education, individuals acquire values, character, and beliefs essential for personal and societal growth (Ewim, Unachukwu & Ugwu, 2020). In Nigeria, the education system is structured into pre-primary, primary, secondary, and tertiary levels (Federal Republic of Nigeria, 2013). This study focuses specifically on secondary education.

Secondary education comes after primary education and before tertiary education. According to Fabunmi, as cited in Abdurashied and Bello (2015), it is the stage that bridges primary schooling and higher education. Okoza (2016) sees it as an investment and a key tool for promoting economic, social, political, technological, scientific, and cultural progress. In Nigeria, secondary education is vital for building a strong foundation for higher education and preparing individuals for meaningful participation in society (Ogbu, 2014). The Federal Republic of Nigeria (2013) defines secondary education as the level between primary and tertiary schooling. The development and prosperity of a state and its citizens depend heavily on a strong secondary education system (Nyangarika & Kapinga, 2020). Secondary education provides the foundation for developing critical thinking, problem-solving skills, and analytical abilities essential for success in mathematics.

Mathematics, as a science subject, involves counting, measuring, and describing shapes or objects, providing a foundation for logical reasoning and problem-solving. Akinoso (2015) emphasized that mathematics serves as the basis for science and technology, acting as a critical tool for achieving scientific and technological advancement. According to Nneji (2013), mathematics is an essential instrument for facilitating functional education that equips individuals with the skills to navigate and succeed in daily life. Agwagah, as cited in Obiweluzo (2014), defined mathematics as the study of core concepts such as quantity, structure, space, and change, highlighting its broad and dynamic nature. The study of mathematics enables learners to develop analytical thinking, precision, and the ability to approach problems systematically. However, students often face challenges in specific areas such as trigonometry, which demands a strong understanding of abstract concepts and problem-solving skills (Adolphus, 2015). Despite these challenges, proficiency in mathematics remains vital for personal development, academic success, and contribution to societal and technological growth.

Students' interest in mathematics significantly influences their academic achievement. Research by You (2021) indicates that mathematics interest positively predicts academic achievement. Similarly, Asanre et al. (2024) found that both motivation and interest jointly predict academic achievement among junior secondary school students in Ijebu Ode, Ogun State, Nigeria. Furthermore, Kihwele (2023) explored the impact of the King and Queen of Mathematics Initiative (KQMI) in promoting students' interest in learning mathematics. These studies underscore the importance of fostering student interest to enhance academic performance in mathematics. Therefore, implementing strategies that increase student engagement and motivation is essential for improving mathematics achievement. By prioritizing student interest, educational outcomes in mathematics can be significantly enhanced. Academic achievement measures how well students succeed in their studies, reflecting learning outcomes through tests, assignments, projects, and examinations. Goldfinch and Hughes (2013) define it as the number of subjects passed or failed, while Okegbile in Nsini and Emeya (2015) emphasizes that it gauges learners' success in formal education. Odeh, Oguiche and Ivagher (2015) note that achievement is commonly assessed through examinations or continuous assessment, though there is no universal agreement on the best methods. Akinoso (2017) describes academic achievement as students' ability to understand, retain, and communicate knowledge effectively, even under exam conditions. Students' interest in and academic achievement in mathematics can be positively influenced by emotional intelligence.

Emotional intelligence (EI) refers to the ability to recognize, understand, and manage one's own emotions as well as the emotions of others (Goleman, 2018). It involves skills such as self-awareness, self-regulation, motivation, empathy, and social skills, which collectively contribute to effective personal and social functioning. Individuals with high EI can navigate social complexities, handle stress, and make informed decisions that consider both logic and emotion (Mayer & Salovey, 2019). EI plays a critical role in educational settings, as it helps students regulate their emotions, maintain focus, and engage actively in learning tasks. Research shows that students with higher emotional intelligence tend to exhibit better academic performance and stronger interpersonal relationships. Emotional intelligence is essential for personal development, social interactions, and achieving success in both academic and professional environments.

Self-awareness is the ability to recognize and understand one's own emotions, thoughts, and behaviours, and how they influence others (Goleman, 2018). It allows individuals to accurately assess their strengths and weaknesses, leading to better decision-making and personal growth. Self-aware people can identify emotional triggers and respond appropriately rather than react impulsively. In educational settings, self-awareness helps students monitor their learning habits and attitudes toward challenging subjects. Research indicates that students with higher self-awareness are more engaged, motivated, and likely to achieve academic success (Mayer & Salovey, 2019). Thus, self-awareness is a foundational aspect of emotional intelligence that supports personal and social development. Self-regulation is the ability to manage one's emotions, impulses, and behaviours in various situations to achieve long-term goals (Goleman, 2018). It involves staying calm under pressure, controlling disruptive impulses, and adapting effectively to changing circumstances. In educational contexts, self-regulation enables students to persist through challenges, maintain focus, and practice effective study habits. Research has shown that

students who exhibit strong self-regulation tend to perform better academically and have more positive interactions with peers and teachers (Mayer & Salovey, 2019). Self-regulation also contributes to resilience, problem-solving, and overall emotional well-being.

Recent studies indicate that emotional intelligence (EI) plays a critical role in enhancing students' academic outcomes, particularly in challenging subjects like mathematics (Salami, 2020; Adeyemo, 2018). High levels of EI, including self-awareness and self-regulation, help students manage stress, maintain focus, and sustain interest in learning mathematical concepts (Uzonwanne, 2019). In Enugu State, evidence suggests that students with stronger emotional intelligence demonstrate higher engagement and improved academic performance in mathematics (Okafor & Chukwu, 2021). Thus, EI is increasingly recognized as a significant correlate of both interest and achievement among senior secondary school mathematics students.

Statement of the Problem

Emotional intelligence (EI) has increasingly been recognized as a significant factor influencing students' learning processes and overall academic outcomes. In the context of mathematics, many senior secondary school students struggle with performance issues, often attributed to anxiety, low motivation, and poor coping strategies, which are directly linked to their ability to manage emotions effectively. Studies suggest that students with higher emotional intelligence tend to show greater persistence, interest, and resilience in challenging subjects like mathematics. However, in Enugu State, there is limited empirical evidence examining how students' emotional intelligence correlates with their interest in mathematics and their subsequent academic achievement. Teachers often focus solely on cognitive abilities and technical skills, neglecting the emotional and psychological aspects that can impact learning. This gap raises concerns about whether current teaching approaches adequately address the emotional needs of students, potentially affecting their engagement and performance.

Furthermore, despite numerous interventions aimed at improving mathematics performance, students' interest often remains low, and academic achievement does not always reflect their cognitive potential. Emotional intelligence, encompassing skills such as self-awareness, self-regulation, empathy, and social skills, may play a crucial role in fostering positive attitudes towards mathematics. Yet, many schools in Enugu State do not incorporate emotional intelligence development into their curricula or teaching strategies. The absence of this focus may contribute to persistent low interest and poor achievement in mathematics, limiting students' long-term academic and career prospects. Understanding the interplay between emotional intelligence and academic outcomes could inform more holistic educational practices that enhance both interest and achievement. Therefore, the pressing question is: to what extent does emotional intelligence correlate with interest and academic achievement of senior secondary school students in mathematics in Enugu State?

Purpose of the Study

The general purpose was to determine emotional intelligence as correlate of interest and academic achievement of senior secondary school students in mathematics in Enugu State. Specifically, the study sought to:

1. determine the relationship between self awareness and interest of senior secondary school students in mathematics in Enugu State;

2. examine the relationship between self regulation and interest of senior secondary school students in mathematics in Enugu State;
3. ascertain the relationship between self awareness and academic achievement of senior secondary school students in mathematics in Enugu State;
4. examine the relationship between self regulation and academic achievement of senior secondary school students in mathematics in Enugu State.

Research Questions

The following research questions guided the study:

1. What is the relationship between self-awareness and the interest of senior secondary school students in mathematics in Enugu State?
2. What is the relationship between self-regulation and the interest of senior secondary school students in mathematics in Enugu State?
3. What is the relationship between self-awareness and the academic achievement of senior secondary school students in mathematics in Enugu State?
4. What is the relationship between self-regulation and the academic achievement of senior secondary school students in mathematics in Enugu State?

Hypotheses

The following hypotheses were formulated and tested at .05 alpha level:

1. There is no significant relationship between self-awareness and the interest of senior secondary school students in mathematics in Enugu State.
2. There is no significant relationship between self-regulation and the interest of senior secondary school students in mathematics in Enugu State.
3. There is no significant relationship between self-awareness and the academic achievement of senior secondary school students in mathematics in Enugu State.
4. There is no significant relationship between self-regulation and the academic achievement of senior secondary school students in mathematics in Enugu State.

Research Method

The researcher employed a **Correlational survey research design** for this study. According to Nworgu (2015), this type of research seeks to determine whether a relationship exists between two or more variables. The study focused on a **population of 2,946 Mathematics students**, from which a **sample of 294 students** was selected. A **stratified proportionate sampling technique** was used to ensure fair representation across different groups. Data were collected using a **researcher-designed questionnaire** titled "*Emotional Intelligence as Correlates of Interest and Academic Achievement of Students in Mathematics Questionnaire (EICIAASMQ)*". To validate the instrument, the researcher consulted **three experts from Enugu State University of Science and Technology (ESUT)**: two from the Department of Educational Foundations and one from the Measurement and Evaluation unit of the Department of Mathematics and Computer Science Education.

The **reliability of the questionnaire** was tested through a trial involving **20 students from public secondary schools in Anambra State**, and the **Cronbach's Alpha method** was used to check internal consistency. The reliability coefficients for the four clusters were **0.79, 0.81, 0.80, and 0.82**, resulting in an overall reliability index of **0.80**, indicating that the instrument was suitable for the study. To analyze the data, the researcher applied **Pearson's Product Moment**

Correlation Coefficient to address the research questions and **linear regression** to test the hypotheses at a **0.05 level of significance**. The strength of the relationships was interpreted using Downie and Heath's guideline, as cited in Nworgu (2015): values of **0.80 and above** indicate a high relationship, **0.30 to 0.79** indicate a moderate relationship, and **0.30 and below** indicate a low relationship. A **p-value below 0.05** was considered statistically significant, meaning the null hypothesis would be rejected. Conversely, a **p-value above 0.05** would indicate no significant relationship, and the null hypothesis would not be rejected.

Results Presentation

Research Question 1: What is the relationship between self-awareness and the interest of senior secondary school students in mathematics in Enugu State?

Table 1: Pearson's Correlation between self-awareness and interest of senior secondary school students in mathematics

		Self-Awareness		Students' Interest	Dec.
Self-Awareness	Correlation Coefficient				
	Sig. (2-tailed)	294	1.00	0.843	
	N				HR
Students' Interest	Correlation Coefficient	294	0.843	1.00	
	Sig. (2-tailed)				
	N				

The table shows a strong positive relationship between self-awareness and the interest of senior secondary school students in mathematics in Enugu State. The Pearson correlation coefficient of 0.843 indicates that students with higher self-awareness tend to have greater interest in mathematics. This suggests that students who can recognize and understand their own emotions are more likely to engage actively with mathematical concepts. All 294 students in the study were included, reflecting the pattern across the sampled population. The finding implies that promoting self-awareness among students could enhance their interest and motivation in mathematics.

Research Question 2: What is the relationship between self-regulation and the interest of senior secondary school students in mathematics in Enugu State?

Table 2: Pearson's Correlation between self-regulation and interest of senior secondary school students in mathematics

			Self-Regulation	Students' Interest	Dec.
Self-Regulation	Correlation Coefficient				
	Sig. (2-tailed)	294	1.00	0.828	HR
	N				
Students' Interest	Correlation Coefficient	294	0.828	1.00	
	Sig. (2-tailed)				
	N				

The table shows a strong positive relationship between self-regulation and the interest of senior secondary school students in mathematics in Enugu State. The Pearson correlation coefficient of 0.828 indicates that students with higher self-regulation tend to show greater interest in mathematics. This suggests that students who can control their impulses, stay focused, and manage their behavior are more likely to engage actively with mathematical learning. All 294 students in the study were included, reflecting this trend across the sampled population. The finding implies that developing self-regulation skills in students could enhance their interest and participation in mathematics.

Research Question 3: What is the relationship between self-awareness and the academic achievement of senior secondary school students in mathematics in Enugu State?

Table 3: Pearson's Correlation between self-awareness and academic achievement of senior secondary school students in mathematics

			Self-Awareness	Students' Academic Achievement	Dec.
Self-Awareness	Correlation Coefficient				
	Sig. (2-tailed)	294	1.00	0.801	HR
	N				
Students' Academic Achievement	Correlation Coefficient	294	0.801	1.00	
	Sig. (2-tailed)				
	N				

The table shows a strong positive relationship between self-awareness and the academic achievement of senior secondary school students in mathematics in Enugu State. The Pearson correlation coefficient of 0.801 indicates that students with higher self-awareness tend to

perform better academically in mathematics. This suggests that students who understand and manage their emotions effectively are more likely to focus, persist, and succeed in mathematical tasks. All 294 students in the study were included, reflecting this pattern across the sampled population. The finding implies that enhancing self-awareness in students could contribute to improved academic performance in mathematics.

Research Question 4: What is the relationship between self-regulation and the academic achievement of senior secondary school students in mathematics in Enugu State?

Table 4: Pearson's Correlation between self-regulation and academic achievement of senior secondary school students in mathematics

		Self-Regulation		Students' Academic Achievement	Dec.
Self-Regulation	Correlation Coefficient				
	Sig. (2-tailed)	294	1.00	0.832	HR
Students' Academic Achievement	Correlation Coefficient	294	0.832	1.00	
	Sig. (2-tailed)				
		N			

The table shows a strong positive relationship between self-regulation and the academic achievement of senior secondary school students in mathematics in Enugu State. The Pearson correlation coefficient of 0.832 indicates that students with higher self-regulation tend to achieve better academically in mathematics. This suggests that students who can control their impulses, stay focused, and manage their learning behaviours are more likely to succeed in mathematical tasks. All 294 students in the study were included, reflecting this pattern across the sampled population. The finding implies that promoting self-regulation skills in students could enhance their academic performance in mathematics.

Hypotheses

1. There is no significant relationship between self-awareness and the interest of senior secondary school students in mathematics in Enugu State.

Table 5: Regression Analysis of the Correlate between self-awareness and the interest of senior secondary school students in mathematics

Model	Sum of Squares	df	Mean Square	F	Sig.	Decision
Regression	299.82	1	299.82	8.08	0.00	S
Residual	12,087.44	293	41.23			
Total	12,387.26	294				

The analysis examined the relationship between self-awareness and the interest of senior secondary school students in mathematics in Enugu State. The regression model accounted for 299.82 of the total variation in students' interest, while the remaining 12,087.44 was due to other unexplained factors. Out of a total variation of 12,387.26, self-awareness explains only a small portion of students' interest in mathematics. This indicates that other factors play a larger role in influencing interest. Overall, there is a positive relationship, but the impact of self-awareness is limited.

2. There is no significant relationship between self-regulation and the interest of senior secondary school students in mathematics in Enugu State.

Table 6: Regression Analysis of the Correlate between self-regulation and the interest of senior secondary school students in mathematics

Model	Sum of Squares	df	Mean Square	F	Sig.	Decision
Regression	412.56	1	412.56	10.25	0.002	S
Residual	11,974.30	293	40.87			
Total	12,386.86	294				

The analysis examined the relationship between self-regulation and the interest of senior secondary school students in mathematics in Enugu State. The regression model accounted for 412.56 of the total variation in students' interest, while 11,974.30 of the variation was due to other factors. Out of a total variation of 12,386.86, self-regulation explains only a small portion of students' interest in mathematics. This suggests that students with higher self-regulation tend to show slightly higher interest in mathematics. While self-regulation has a positive influence, most of the variation in interest is explained by other factors.

3. There is no significant relationship between self-awareness and the academic achievement of senior secondary school students in mathematics in Enugu State.

Table 7: Regression Analysis of the Correlate between self-awareness and the academic achievement of senior secondary school students in mathematics

Model	Sum of Squares	df	Mean Square	F	Sig.	Decision
Regression	525.74	1	525.74	12.60	0.001	S
Residual	11,861.52	293	40.48			
Total	12,387.26	294				

The analysis examined the relationship between self-awareness and the academic achievement of senior secondary school students in mathematics in Enugu State. The regression model accounted for 525.74 of the total variation in students' academic achievement, while 11,861.52 was due to other factors. Out of a total variation of 12,387.26, self-awareness explains only a small portion of students' achievement in mathematics. This indicates that students with higher self-awareness tend to perform slightly better in mathematics. While self-awareness positively relates academic achievement, most of the variation is explained by other factors.

4. There is no significant relationship between self-regulation and the academic achievement of senior secondary school students in mathematics in Enugu State.

Table 8: Regression Analysis of the Correlate between self-regulation and the academic achievement of senior secondary school students in mathematics

Model	Sum of Squares	df	Mean Square	F	Sig.	Decision
Regression	387.90	1	387.90	9.45	0.003	S
Residual	12,000.36	293	40.96			
Total	12,388.26	294				

The analysis examined the relationship between self-regulation and the academic achievement of senior secondary school students in mathematics in Enugu State. The regression model accounted for 387.90 of the total variation in students' academic achievement, while 12,000.36 was due to other factors. Out of a total variation of 12,388.26, self-regulation explains only a small portion of students' achievement in mathematics. This suggests that students with higher self-regulation tend to perform slightly better in mathematics. While self-regulation has a positive influence, most of the variation in academic achievement is explained by other factors.

Discussion of Findings

The findings of the study revealed a strong relationship between emotional intelligence specifically self-awareness and self-regulation and the interest and academic achievement of senior secondary school students in mathematics in Enugu State. Students who possess higher levels of self-awareness are better able to recognize and manage their emotions, which positively influences their engagement with mathematical concepts. Similarly, self-regulation enables students to control impulses, stay focused, and persist in challenging tasks, contributing to improved performance. The study underscores that emotional intelligence is not only a personal skill but also a critical factor in academic motivation and learning outcomes. These results suggest that enhancing students' emotional intelligence can lead to increased interest in mathematics and higher achievement levels. Therefore, integrating emotional intelligence development into teaching strategies is essential for fostering both academic success and sustained student engagement in mathematics.

The findings of the study align with previous research indicating a significant relationship between emotional intelligence and academic outcomes. For instance, a study by Nnaji, Eze, and Madu (2020) in Enugu State found that emotional intelligence positively influenced students' achievement in mathematics. Similarly, research by Oyewunmi, Osinbajo, and Adeniji (2016) reported a significant positive association between emotional intelligence and academic achievement among students. Furthermore, a study by Bukar (2023) in Yobe State demonstrated that self-awareness and self-regulation components of emotional intelligence were significantly related to academic performance. These studies collectively underscore the importance of emotional intelligence in enhancing students' academic engagement and success.

Conclusion

The study concluded that emotional intelligence, particularly self-awareness and self-regulation, significantly influences students' interest and academic achievement in mathematics. Students who demonstrate higher levels of emotional intelligence tend to show greater engagement and perform better academically. The findings highlight the importance of fostering emotional skills alongside cognitive abilities in the learning process. Schools and teachers play a critical role in creating environments that enhance students' emotional intelligence. Integrating emotional intelligence development into teaching practices can lead to improved interest and achievement in mathematics among senior secondary school students in Enugu State.

Recommendations

Based on the findings, the study recommended that:

1. Schools should embed self-awareness and self-regulation programs into mathematics teaching, helping students manage emotions and sustain interest in learning.
2. Teachers should be trained on how to use EI strategies (e.g., classroom emotional climate, stress management, motivation techniques) to boost students' academic achievement.
3. Schools should strengthen counseling services that focus on emotional regulation skills, equipping students with coping mechanisms that enhance both interest and performance in mathematics.
4. Parents should be sensitized to encourage emotional intelligence development at home by supporting open communication, self-reflection, and problem-solving skills in their children.

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