

INFLUENCE OF SOCIAL SKILLS AND EMPATHY ON STUDENTS' ACADEMIC ACHIEVEMENT IN SENIOR SECONDARY SCHOOL BIOLOGY IN KOGI STATE.

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Abstract

This study investigated the influence of social skills and empathy on students' academic achievement in senior secondary school Biology in Kogi State. The problem of persistent low achievement in Biology prompted an examination of how these socio-emotional factors relate to students' performance. The study adopted a correlational research design and involved 313 SS II Biology students selected from a population of 1,429 across 11 government-owned secondary schools in Lokoja Local Government Area. A structured instrument the Questionnaire on Social Skills and Empathy in Biology (QSSEB) was used for data collection, and its reliability coefficients were 0.85 for social skills and 0.88 for empathy. Data were analyzed using descriptive statistics and correlation. Findings revealed a low positive relationship between social skills and academic achievement in Biology ($r = 0.21$), a very low negative relationship between empathy and achievement ($r = -0.01$), and a very low positive joint relationship between the two variables and achievement ($r = 0.04$). None of these correlations were statistically significant at the 0.05 level. The study therefore concluded that social skills and empathy, individually or jointly, do not significantly predict students' academic achievement in Biology in the study area. It recommends that efforts to improve Biology performance should focus more on strengthening intrapersonal emotional competencies and enhancing instructional strategies rather than relying solely on interpersonal skills.

Keywords: Social Skills, Empathy, Emotional Intelligence, Academic Achievement, and Correlational.

Introduction

Students' academic achievement in Biology is shaped not only by their cognitive abilities but also by socio-emotional competencies that influence how effectively they learn, communicate and participate in classroom activities. As a practical and interaction-intensive subject, Biology requires students to collaborate during experiments, engage in group discussions, and interpret scientific concepts through shared learning experiences. In such environments, social skills enable students to communicate clearly, work cooperatively and build productive peer relationships, while empathy fosters understanding, mutual support, and a positive classroom climate. These socio-emotional factors have been increasingly recognised in recent research as potential contributors to improved engagement and performance. However, despite persistent concerns about low academic achievement in Biology among senior secondary school students in Kogi State, limited empirical attention has been given to how social skills and empathy jointly relate to students' learning outcomes. This study therefore seeks to examine the relationship between social skills, empathy and students' academic achievement in Biology in Kogi State.

Biology equips learners with scientific literacy, critical thinking and knowledge about their bodies and the natural world. Because it often involves group experiments, discussions and collaborative problem-solving, students need strong social skills to communicate clearly, share ideas and work effectively with peers and teachers. Social skills refer to the ability to interact effectively with others, build relationships and influence or inspire others positively. Effective communication, conflict resolution and collaboration help students contribute to group tasks and navigate interpersonal interactions that enhance learning. According to Goleman (2017), individuals with strong social skills can work well in teams, build rapport and resolve conflicts constructively. Therefore, in academic settings, social skills encompass students' ability to interact productively with peers and teachers through communication, cooperation and active listening. This study explores how these skills influence performance in Biology, a subject that relies heavily on teamwork and meaningful interaction.

Research has shown that students with high social skills tend to perform better academically because they can effectively navigate the social and emotional aspects of the learning environment. These students are more likely to engage with their classmates and teachers, participate actively in discussions and seek help when needed (Brackett, Katulak, and Salovey, 2020). In biology, where group work, discussions and presentations are often essential, students with strong social skills are more likely to contribute meaningfully, leading to enhanced understanding and improved academic performance (Feldman, Spector & O'Connor 2021).

Research has demonstrated that social skills play a role in emotional regulation and self-motivation, which are essential for academic achievement. Students who are adept at managing social interactions are often better equipped to manage their emotions and remain focused on their academic goals, even in challenging situations (Schutte et al., 2021). However, despite the recognized importance of social skills in academic success, there is a gap in research examining how social skills specifically influence academic achievement in biology and other science subjects while social skills are well-documented as a key factor in academic success, their specific impact on students' achievement in biology. Therefore, further research is needed in determining students' academic achievement with the influence of social skills and students' empathy.

Empathy is particularly relevant in science education, where group work and peer interactions are common. Studies suggest that empathetic students contribute to a more inclusive classroom dynamic, which positively influences collective learning outcomes (Caprara et al., 2010). In subjects like biology, where teamwork and communication are essential, empathy enables students to work effectively in groups, thus enhancing their understanding and academic achievement (Woolf et al., 2020). Empathy also supports students in handling the emotional challenges often encountered in rigorous academic subjects, such as stress, frustration and fear of failure, allowing them to maintain focus and motivation (Brackett et al., 2011).

Despite its importance, the relationship between empathy and academic achievement remains underexplored, particularly in the context of biology education. While there is considerable evidence that empathy positively impacts social and emotional outcomes (Durlak et al., 2011), few studies have specifically examined how empathy influences performance in science subjects. Research by Jolliffe and Farrington (2006) emphasized the role of empathy in academic success but did not address how it relates to achievement in specific disciplines like biology. This gap in the literature underscores the need for further investigation into how empathy interacts with other aspects of emotional intelligence to affect students' academic achievement in Biology.

Empathy also interacts with other emotional intelligence components, such as self-regulation and motivation, which can further enhance students' academic outcomes (Mayer et al., 2004; Salovey). However, the limited research focusing on empathy's direct impact in subjects like biology highlights the need for more empirical studies to understand the mechanisms through which empathy contributes to academic success.

Academic achievement is commonly defined as the extent to which a student has attained their educational goals, typically measured through grades, assessments, or other forms of evaluation. It represents a multidimensional construct that encompasses cognitive abilities, knowledge acquisition and skills development in specific subjects (Zimmerman and Schunk, 2021). In educational psychology, academic achievement is often linked to students' performance across various subject areas and is considered a critical indicator of their ability to understand, retain and apply the knowledge they gain throughout their education (Perkins et al., 2020). According to Kaplan et al. (2019), academic achievement is not only about mastering subject content but also involves the development of important life skills such as problem-solving, critical thinking and time management, all of which contribute to overall student success.

Furthermore, academic achievement is also shaped by external factors such as the quality of instruction, availability of resources, and the socio-economic background of students (Mayer et al., 2020). Emotional intelligence (EI) has increasingly been recognized as an important factor influencing academic achievement, with studies highlighting the role of self-regulation, motivation and social skills in enhancing academic performance (Goleman, 2021). For example, strong social skills have been linked to improved performance in subjects that demand collaboration, communication, and active participation, such as Biology (Perkins et al., 2020). Likewise, empathy has been found to support positive peer interactions and reduce classroom conflicts, enabling students to remain engaged and maintain better academic performance (Mayer et al., 2020). To this effect, a gap still exists in understanding how specific components of emotional intelligence particularly social skills and empathy influence senior secondary school students' academic achievement in Biology, especially within Lokoja Local Government Area of Kogi State.

Objectives of the study

The general objective of this study is to explore how social skills and empathy influence students' academic achievement in senior secondary school Biology in Kogi State. The study aims to:

1. investigate the relationship between social skills and students' academic achievement in Biology.
2. examine the relationship between empathy and students' academic achievement in Biology.
3. determine the joint relationship between social skills, empathy and students academic achievement in biology in Kogi State.

Research Questions

1. What is the relationship between social skills and students' academic achievement in Biology in Kogi State?
2. What is the relationship between empathy and students' academic achievement in Biology in Kogi State?
3. To what extent do social skill and empathy jointly relate to students academic achievement in biology in Kogi State.

Hypotheses

The following null hypotheses guided the study;

H01: There is no significant relationship between social skills and students' academic achievement in Biology in Kogi State.

H02: There is no significant relationship between empathy and students' academic achievement in Biology in Kogi State.

H03: There is no significant joint relationship between social skills and empathy and students' academic achievement in Biology in Kogi State.

Methodology

The study adopted a correlational research design. Correlational survey research design according to Nworgu (2015) is a design that seeks to establish the relationship that exists between two or more variables. The design aims to determine the relationship between emotional intelligence (social skills and empathy) and students' academic achievement. The population of the study comprised 1,429 Biology students enrolled in Senior Secondary School (SS II) across 11 government-owned senior secondary schools in Lokoja Local Government Area of Kogi State. The sample for the study was 313 SS II Biology students drawn from the population using a multistage sampling procedure. Three research questions and three null hypotheses guided the study. The instrument, Questionnaire on Social Skills and Empathy in Biology (QSSEB), was used for data collection with two clusters, which had four Likert scale options ranging from Strongly Agree (4) to Strongly Disagree (1). The instrument was subjected to face validation by three experts in the Faculty of Education two from the Department of Science Education and one from the Department of Educational Psychology and their suggestions were incorporated into the final version. To ensure the reliability of the instrument, a small sample of students outside the study area was used to conduct a pilot study. Internal consistency coefficients of 0.85 (social skills) and 0.88 (empathy) were obtained using Cronbach Alpha. The questionnaire was self-administered to the selected respondents and collected immediately to ensure maximum return. Data were analyzed using mean and standard deviation.

Results

Table 1: What is the relationship between social skills and students' academic achievement in Biology
n = 313

Variable	R	r ²
Social Skills	0.21	0.00
Biology Achievement		

Key: n = Number of respondents, r = Correlation coefficient, r² = Coefficient of determination

The result in Table 1 shows that there is a relationship between students' scores on social skills and their academic achievement in Biology. The result shows a correlation coefficient of 0.21, indicating a low positive relationship between social skills and students' academic achievement in Biology.

Hypothesis One: There is no significant relationship between social skills and students academic achievement in Biology.

The result presented in Table 1 shows a correlation coefficient of $r = 0.21$ between social skills and students' academic achievement in Biology. This indicates a low positive relationship between the two variables.

However, the correlation is not statistically significant at the 0.05 level. Therefore, the null hypothesis is not rejected.

This implies that social skills do not have a significant influence on students' academic performance in Biology in Kogi State. In essence, variations in students' social skills are not strong predictors of their achievement in the subject.

Table 2: What is the relationship between empathy and students' academic achievement in Biology n = 313

Variable	R	r ²
Empathy	-0.01	0.00
Biology Achievement		

Key: n = Number of respondents, r = Correlation coefficient, r² = Coefficient of determination

Table 2 presents the relationship between students' empathy and their academic achievement in Biology. The result shows a correlation coefficient of $r = -0.01$ and a coefficient of determination of $r^2 = 0.00$, indicating a negligible negative relationship between the two variables.

Hypothesis Two: There is no significant relationship between empathy and students' academic achievement in Biology.

The correlation coefficient ($r = -0.01$) is not statistically significant at the 0.05 level. Therefore, the null hypothesis is not rejected. This implies that students' levels of empathy do not significantly influence their academic achievement in Biology in Kogi State. In practical terms, empathy is not a meaningful predictor of students' performance in the subject.

Table 3: To what extent do social skill and empathy jointly relate to students academic achievement in biology. n = 313

Variable	R	r ²
Joint Emotional Intelligence	0.04	0.00
Biology Achievement		

Key: n = Number of respondents, r = Correlation coefficient, r² = Coefficient of determination

Table 3 shows the joint relationship between components of $r^2 = 0.00$, reflecting a very low positive relationship. Emotional intelligence (social skills and empathy) and students' academic achievement in Biology. The result indicates a correlation coefficient of $r = 0.04$ and a coefficient of determination of $r^2 = 0.00$, reflecting a very low positive relationship.

Hypothesis Three: There is no significant relationship between social skills, empathy and students' academic achievement in Biology.

The obtained correlation ($r = 0.04$) is not statistically significant at the 0.05 level. Thus, the null hypothesis is not rejected. This suggests that the combined effect of social skills and empathy does not significantly influence students' academic achievement in Biology in Kogi State. Overall, these components of emotional intelligence do not serve as meaningful predictors of students' performance in the subject.

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Discussion

The finding that social skills have a low positive relationship with academic achievement in Biology aligns with earlier studies showing that interpersonal abilities provide only slight learning benefits. Debnath (2018) similarly reported a low positive and insignificant relationship, indicating that students who interact better with peers and teachers may gain small advantages, though the effect is limited. While Quispe-Quispe (2022), Gul et al. (2023), and Haneef (2024) found strong significant

positive relationships, the present study differs, possibly due to cultural restrictions that limit student interactions, especially between opposite genders, reducing opportunities for collaboration in Biology. Overall, the findings show that although social skills support learning environments, their direct influence on Biology achievement is weak, emphasizing the need to encourage meaningful peer and teacher interactions to enhance learning.

The study also found a low negative relationship between empathy and students' academic achievement in Biology, meaning increases in empathy may slightly reduce performance. This weak inverse relationship was not statistically significant, indicating minimal linear dependence. Students who focus heavily on others' feelings may pay less attention to their own learning, limiting empathy's academic impact. Cultural and religious restrictions on collaboration may also reduce chances for empathy to support learning (Karni, 2020; González, 2017). These findings agree with Kim (2024), who reported a low negative insignificant relationship, but contrast with Onwubiko (2020) and Jain (2021), who found positive correlations and with Javaeed et al. (2022), who found no relationship. While teacher empathy has been shown to enhance achievement (Zhang, 2022; Sarwer et al., 2024), this study focusing on students' empathy shows a weak negative association. Overall, empathy has limited influence on Biology achievement within this context.

The study further found a very low positive relationship between the combined components of social skills and empathy and students' academic achievement in Biology, which was not statistically significant. This shows that even together, these traits do not meaningfully predict performance. Contextual factors such as cultural and religious restrictions that limit interaction reduce opportunities for these interpersonal skills to enhance outcomes (Karni, 2020; González, 2017). Additionally, attention to others' concerns may compete with students' engagement with instructional content, limiting potential academic benefits (Tran et al., 2023; Paro et al., 2014). These results align with research showing that intrapersonal emotional intelligence components, such as self-awareness and motivation, are more strongly linked to achievement than interpersonal traits like social skills and empathy (Wu et al., 2022; Nwosu & Samuel, 2022). While earlier studies found that social skills or empathy may support learning individually (Debnath, 2018; Kim, 2024), this study shows that their combined influence on Biology performance is weak and insignificant. Overall, the findings suggest that improving Biology achievement should focus on intrapersonal emotional intelligence and subject-specific strategies rather than relying on social-emotional skills alone.

The study found that social skills and empathy have minimal influence on senior secondary school students' academic achievement in Biology in Kogi State. Social skills showed a low positive relationship, while empathy exhibited a low negative relationship and their combined effect was also negligible; none were statistically significant. These findings suggest that interpersonal components of emotional intelligence alone do not meaningfully predict performance, possibly due to cultural restrictions and limited collaborative opportunities. The results highlight the need to focus on intrapersonal traits, such as self-awareness and motivation, alongside effective teaching strategies, to improve academic outcomes in Biology.

Conclusion

The study found that social skills and empathy have minimal influence on senior secondary school students' academic achievement in Biology in Kogi State. Social skills showed a low positive relationship, while empathy exhibited a low negative relationship and their combined effect was also negligible; none were statistically significant. These findings suggest that interpersonal components of emotional intelligence alone do not meaningfully predict performance, possibly due to cultural

restrictions and limited collaborative opportunities. The results highlight the need to focus on intrapersonal traits, such as self-awareness and motivation, alongside effective teaching strategies, to improve academic outcomes in Biology.

Recommendations

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

Improvement of Instructional Strategies in Biology: Biology teachers should adopt learner-centred and activity-based instructional strategies such as inquiry-based learning, problem-solving approaches and the use of instructional materials to enhance students' understanding and academic achievement, rather than relying primarily on social interaction among students.

Strengthening Cognitive and Academic Support Systems: Schools should provide structured academic support, including remedial classes, guided practice and continuous assessment, to address students' learning gaps in Biology and improve overall performance.

Teacher Professional Development: Training programmes, workshops and seminars should be organized for teachers to equip them with effective pedagogical skills, classroom management techniques and strategies for fostering student engagement and motivation in science subjects.

Context-Sensitive Classroom Practices: Given the possible influence of cultural and social constraints on student interaction, teachers should design classroom activities that encourage participation within acceptable social norms, ensuring that all students are actively engaged without compromising contextual realities.

Balanced Integration of Emotional and Cognitive Skills: Although social skills and empathy were not significant predictors, they should not be entirely neglected. Instead, they should be integrated in a complementary manner alongside cognitive and instructional strategies to support a holistic learning environment.

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