

PERCEIVED INFLUENCE OF PSYCHOLOGICAL AND SOCIAL FACTORS ON SECONDARY SCHOOL STUDENTS' ACADEMIC ACTIVITIES IN BIOLOGY IN AWKA SOUTH LOCAL GOVERNMENT

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Abstract

This study examined the perceived influence of psychological and social factors on students' academic activities in senior secondary school biology in Awka South Local Government Area of Anambra State. The study adopted a descriptive survey research design. The population comprised 1,648 Senior Secondary School Two (SSII) biology students from 19 government-owned secondary schools in the study area. A sample of 160 students was drawn using a multi-stage sampling technique. The study was guided by six research questions. Data were collected using a structured questionnaire, which was validated by experts from the Science Education Department and a specialist in Education Measurement and Evaluation. The reliability of the instrument was established using Cronbach Alpha, yielding a coefficient of 0.72, indicating high internal consistency. Data were analyzed using mean and standard deviation. Findings revealed that students with positive self-concepts achieve better results and demonstrate resilience in academic challenges, while test anxiety reduces focus and confidence, negatively affecting performance. Students with higher intelligence quotients exhibited superior cognitive abilities, enhancing academic achievement. Positive peer influence promoted collaboration and motivation, whereas negative peer influence encouraged distraction and procrastination. Socio-economic status was perceived to have minimal direct impact on academic performance, provided equal learning opportunities exist. Furthermore, positive teacher-student relationships enhanced motivation, engagement, and academic outcomes. Based on these findings, the study recommends fostering positive self-concepts through motivational and support programs, implementing strategies to reduce test anxiety, and promoting constructive peer interactions and supportive teacher-student relationships to improve students' academic performance in biology.

Keywords: Self-concept, Test Anxiety, Intelligence Quotient, Peer Group, Socio-Economic Status, Teacher-Student Relationship, Academic Activities, Senior Secondary School Biology

Introduction

Biology occupies a central position in the senior secondary school curriculum as a foundational science subject and a prerequisite for numerous professional and science-related disciplines, including medicine, pharmacy, agriculture, microbiology, and other applied sciences. Scholars have consistently conceptualized Biology as the study of living organisms, their structures, functions, behaviours, and interactions with their environments (Obialor et al., 2020; Ibeh & Okigbo, 2024). The scope of Biology extends from molecular and cellular processes to ecosystem dynamics and the biosphere, thereby positioning it as a discipline that integrates both microscopic and macroscopic dimensions of life. Beyond its disciplinary breadth, Biology contributes significantly to societal development by equipping learners with knowledge relevant to health, environmental sustainability, and scientific literacy. It fosters understanding of hygiene, nutrition, disease prevention, vaccination, food digestion, breathing, sweating and the neurological system and ecological responsibility (Ghumdia and Adams 2020). Given its strategic importance, effective learning of Biology in senior secondary schools in Nigeria and other countries, as well as in other structured learning environments, requires sustained engagement in well-organized academic activities, including practical experiments, collaborative inquiry, assignments, and evaluative tasks.

Every year, senior secondary school students in Nigeria take part in the West African Senior School Certificate Examination (WASSCE), conducted twice annually in May/June and November/December. The Chief Examiners provide reports that highlight students' overall performance, identifying both strengths and weaknesses. Unfortunately, students' performance in Biology has often been inconsistent and, in some years, unsatisfactory. Despite the recognized importance of Biology within the secondary school curriculum, students' performance in WASSCE has been fluctuating and this calls for a concern. For example, in 2019, 604,436 of 1,086,449 candidates (55.6%) obtained credit passes (A1–C6). The pass rate increased to 652,647 of 1,032,246 candidates (63.2%) in 2020 but declined to 594,674 of 1,023,685 candidates (58.1%) in 2021. In 2022, there was a slight improvement to 672,538 of 1,048,242 candidates (64.2%), followed by a drop to 584,432 of 1,068,564 candidates (54.7%) in 2023. This trend suggests that challenges in Biology achievement may not be attributable solely to curricular content or instructional design but may also be influenced by learner-related psycho-social factors. Consequently, examining the psycho-social determinants of students' academic activities in senior secondary school Biology becomes both timely and necessary, particularly within specific socio-educational contexts such as

Awka South Local Government Area of Anambra State. Academic activities encompass structured engagements through which knowledge is acquired, constructed, and demonstrated. These include participation in lessons, assignments, projects, presentations, discussions, and research-oriented tasks (Kpolovie, Joe & Okoto, 2014). Such activities are central to knowledge consolidation and skill acquisition and are supported by institutional norms promoting academic integrity and intellectual development. However, the extent and quality of students' participation in academic activities are often shaped by psychological dispositions and social environments, collectively conceptualized as psycho-social variables.

Psychological variables operate at the level of individual cognition and affect. One of the most extensively studied constructs in this domain is self-concept. Self-concept refers to individuals' organized perceptions, beliefs, and evaluations of their own abilities, attributes, and identity (García-Martínez et al., 2022). It reflects how students perceive their academic competence and personal worth within the learning environment. Research indicates that students with a positive academic self-concept tend to demonstrate higher motivation, persistence, and engagement in cognitively demanding tasks, whereas those with a negative self-concept may withdraw from active participation. Within the context of Biology, where abstract reasoning and conceptual integration are often required, students' perceptions of their own competence may significantly shape their level of engagement in academic activities. Closely linked to self-concept is the emotional dimension of learning, particularly test anxiety. Test anxiety represents a maladaptive emotional response to evaluative situations characterized by excessive worry, physiological arousal, and cognitive interference (Dami et al., 2019). It may impair concentration, working memory, and problem-solving ability, thereby disrupting academic performance. Persistent anxiety symptoms including restlessness, muscle tension, and difficulty concentrating have been associated with reduced academic efficiency (Dami, et al., 2019). In subjects such as Biology, which often require analytical thinking and recall of detailed information, high levels of test anxiety may undermine students' effective participation in academic activities and assessments.

In addition to affective factors, cognitive capacity remains a central determinant of academic engagement. Intelligence, commonly operationalized through Intelligence Quotient (IQ) assessments, is associated with reasoning ability, abstract thinking, problem-solving, and information processing efficiency (Mulyani, & Lubis 2024). While intelligence alone does not determine academic success, it provides a cognitive foundation upon which learning processes operate. Students with higher cognitive ability are often better able to understand complex

biological concepts, integrate theoretical knowledge with practical tasks, and sustain academic engagement. While psychological factors shape students' internal capacities and dispositions for learning, social and environmental contexts further influence how these capacities are expressed and translated into academic engagement.

Whereas psychological variables emphasize internal dispositions, sociological variables reflect the influence of social contexts on students' academic behavior. Peer influence, for instance, constitutes a powerful social force during adolescence. Peer groups can reinforce academic diligence or, conversely, promote disengagement from school-related activities (Costa, 2024). In science education, peer norms may shape attitudes toward academic rigor, participation in laboratory activities, and persistence in challenging tasks (Brierley & Reid 2022). Thus, peer interactions may function as either facilitative or inhibitive forces in students' engagement with Biology.

Parental socio-economic status (SES) further contextualizes students' academic experiences. SES encompasses parental income, educational attainment, occupational status, and access to material and cultural resources (Faiza & Daud, 2023). Higher SES often correlates with access to learning materials, academic support, conducive study environments, and enrichment opportunities. Conversely, lower SES may limit educational resources and increase stressors that interfere with sustained academic participation. Consequently, socio-economic disparities may translate into differences in students' engagement and achievement in Biology. Another critical social determinant is the quality of teacher–student relationships. Educational research has consistently demonstrated that supportive, respectful, and responsive teacher–student interactions foster academic motivation, engagement, and socio-emotional development (Liu, Xiaonan, 2024; OECD, 2023). Positive relational climates create psychologically safe learning environments in which students are more willing to ask questions, participate in discussions, and engage in practical tasks. In contrast, strained relationships may reduce classroom participation and weaken academic commitment.

Biology remains a core science subject in senior secondary school education and a foundational requirement for many science-based and professional courses. However, despite the deployment of qualified Biology teachers and widespread availability of recommended instructional materials in Awka South Local Government Area of Anambra State, students' academic engagement and achievement in Biology remain inconsistent. Recent West African Examinations Council (WAEC) Chief Examiners' Reports from 2019 to 2023 reveal persistent

fluctuations in student performance in Biology, with no sustained improvement trend over the five-year period. These fluctuations point to underlying challenges that extend beyond instructional inputs and resource availability. Although interventions such as curriculum revisions, teacher capacity building, and provision of learning resources have been implemented at various levels, they have yielded limited and inconsistent effects on students' Biology outcomes. This suggests that conventional approaches alone may be insufficient unless accompanied by a deeper understanding of learner-related psycho-social determinants. Research indicates that students' academic activities are influenced not only by teaching quality and materials but also by psychological dispositions (e.g., self-concept, test anxiety, intelligence) and sociological contexts (e.g., peer influence, parental socio-economic status, teacher–student relationship). These factors may shape students' motivation, participation, and persistence in Biology learning.

Despite recognition of these influences, there is limited empirical evidence examining their combined perceived influence on students' academic activities in senior secondary school Biology within the specific context of Awka South Local Government Area. This gap limits the development of targeted interventions aimed at enhancing students' engagement and stabilizing performance trends. It is to this end that this study seeks to examine the perceived influence of selected psychological and sociological factors on students' academic activities in senior secondary school Biology in Awka South Local Government Area of Anambra State.

Specifically, the study sought to determine the perceived influence of:

1. Self-concept on students' academic activities in senior secondary school Biology.
2. Test anxiety on students' academic activities in senior secondary school Biology.
3. Intelligence quotient (IQ) on students' academic activities in senior secondary school Biology.
4. Peer group influence on students' academic activities in senior secondary school Biology.
5. Parental socio-economic status on students' academic activities in senior secondary school Biology.
6. Teacher–student relationship on students' academic activities in senior secondary school Biology.

Research Questions

The following research questions guided the study: What is the perceived influence of:

1. Self-concept on students' academic activities in senior secondary school Biology in Awka South Local Government Area of Anambra State?
2. Test anxiety on students' academic activities in senior secondary school Biology in Awka South Local Government Area of Anambra State?
3. Intelligence quotient (IQ) on students' academic activities in senior secondary school Biology in Awka South Local Government Area of Anambra State?
4. Peer group influence on students' academic activities in senior secondary school Biology in Awka South Local Government Area of Anambra State?
5. Parental socio-economic status on students' academic activities in senior secondary school Biology in Awka South Local Government Area of Anambra State?
6. Teacher–student relationship on students' academic activities in senior secondary school Biology in Awka South Local Government Area of Anambra State?

Methods

This study adopted a descriptive survey design to examine the perceived influence of selected psychological and sociological factors on students' academic activities in senior secondary school Biology in Awka South Local Government Area of Anambra State. The descriptive survey design was considered appropriate as it enables the systematic collection of data from a representative sample in order to describe existing conditions and relationships among variables within a defined population. The study was conducted in Awka South Local Government Area, the capital territory of Anambra State, located in South-Eastern Nigeria. The area comprises nineteen accredited public secondary schools under the Post Primary Schools Service Commission (PPSSC). The population of the study consisted of all Senior Secondary School Two (SSII) Biology students in the nineteen public secondary schools in Awka South Local Government Area, totaling 1,648 students according to PPSSC (2024) records. A sample of 160 SSII Biology students was drawn using a multi-stage sampling procedure. In the first stage, five schools were selected through simple random sampling (balloting). In the second stage, proportionate stratified sampling was employed to select students from each of the selected schools, ensuring equitable representation. The final sample constituted

approximately 10% of the accessible population and was considered adequate for survey research involving large populations.

Data were collected using a researcher-developed structured questionnaire designed to elicit students' perceptions of psychological and sociological factors influencing their academic activities in Biology. The instrument employed a four-point Likert-type scale of Strongly Agree (4), Agree (3), Disagree (2), and Strongly Disagree (1). The questionnaire was subjected to face and content validation by two experts in Science Education and one specialist in Measurement and Evaluation, all from Nnamdi Azikiwe University. Their observations informed the refinement of the final instrument. Reliability was established using the test–retest method outside the study area, and internal consistency was determined using Cronbach's alpha, which yielded a coefficient of 0.72, indicating acceptable reliability for research purposes. The instrument was administered directly to respondents by the researcher with the assistance of school authorities, and all copies were retrieved on the same day to ensure a high return rate. Data collected were analyzed using weighted mean and standard deviation to answer the research questions. A criterion mean of 2.50 was adopted as the decision benchmark; items with mean scores of 2.50 and above were regarded as agreed, while those below 2.50 were regarded as disagreed. This analytical approach was considered appropriate for interpreting perception-based survey data in line with established educational research standards.

Results

Table 1: Perceived Influence of Self-Concept on Students' Academic Activities

S/N	Item	N	Mean	SD	Decision
Students with positive self-concept					
1	tend to achieve better results due to their belief in their capabilities	210	3.20	0.65	Agree
Students with positive self-concept					
2	overcome academic challenges and persist in the face of academic obstacles	210	3.05	0.72	Agree
Students with negative self-concept					
3	tend to achieve higher academic accolades and grades	210	2.85	0.68	Agree

Students with negative self-concept					
4	exhibit inferior problem-solving abilities and critical thinking skills	210	2.70	0.75	Agree
Students with negative self-concept					
5	are likely not to persist in academic tasks or foster resilience in the face of challenges	210	2.88	0.70	Agree
Grand Mean			2.94		Agree

Table 1 reveal that respondents generally agreed that self-concept influences students' academic activities, with a grand mean of 2.94.

Table 2: Perceived Influence of Test Anxiety on Students' Academic Activities

S/N	Item	N	Mean	SD	Decision
6	Test anxiety can make students struggle to focus during examinations	210	3.21	0.64	Agree
7	Test anxiety can discourage students from engaging in academic activities	210	2.99	0.71	Agree
8	Test anxiety can erode students' confidence in their abilities	210	2.93	0.73	Agree
9	Test anxiety can make students panic or feel despair during examinations	210	2.87	0.76	Agree
10	Test anxiety can make students lose focus due to emotional stress	210	2.62	0.78	Agree
Grand Mean			2.92		Agree

Table 2 shows that respondents agreed that test anxiety negatively affects academic activities, yielding a grand mean of 2.92.

Table 3: Perceived Influence of Intelligence Quotient on Students' Academic Activities

S/N	Item	N	Mean	SD	Decision
11	Students with high IQ tend to perform better in academic activities	210	3.26	0.67	Agree
12	Students with high IQ overcome academic challenges and persist	210	3.05	0.70	Agree
13	Students with low IQ likely do not persist in academic tasks	210	2.96	0.72	Agree
14	Students with high IQ have better cognitive abilities (logical reasoning, comprehension, verbal skills)	210	2.87	0.74	Agree
15	Students with negative self-concept exhibit inferior problem-solving and critical thinking skills	210	2.60	0.79	Agree
Grand Mean			2.94		Agree

Table 3 shows that IQ is a significant determinant of academic performance in Biology, with a grand mean of 2.94.

Table 4: Perceived Influence of Peer Group on Students' Academic Activities

S/N	Item	N	Mean	SD	Decision
16	Peer groups encourage students to work harder and strive for academic excellence	210	3.27	0.66	Agree
17	Peer groups help students engage in collaborative learning	210	2.95	0.69	Agree
18	Peer groups reduce feelings of isolation and increase engagement	210	2.84	0.72	Agree
19	Peer groups can be a source of distraction	210	2.78	0.74	Agree
20	Peers can encourage/lead to procrastination of academic activities	210	2.67	0.76	Agree
Grand Mean			2.90		Agree

The results presented in Table 4 reveal that respondents reported that peer groups have influence on academic engagement, reflected in a grand mean of 2.90. Positive peer interactions encourage collaboration, knowledge sharing, and emotional support, whereas negative peer influence may result in distraction or procrastination.

Table 5: Perceived Influence of Socio-Economic Status on Students' Academic Activities

S/N	Item	N	Mean (X)	SD	Decision
21	Students from higher SES tend to have greater access to resources such as textbooks	210	2.60	0.79	Agree
22	Students from higher SES have conducive learning environments	210	2.50	0.80	Agree
23	Students from higher SES may have more opportunities to participate in extracurricular activities	210	2.37	0.81	Disagree
24	Students from higher SES are more likely to drop out due to financial constraints	210	2.25	0.83	Disagree
25	Students from higher SES often experience an achievement gap compared to their peers from higher socio-economic background	210	2.10	0.84	Disagree
Grand Mean			2.36		Agree

The results presented in Table 5 reveal that a relatively low grand mean of 2.36, indicating that respondents perceive SES as less influential compared to other factors.

Table 6: Perceived Influence of Teacher-Student Relationship on Students' Academic Activities

S/N	Item	N	Mean (X)	SD	Decision
26	Positive teacher-student relationships increase student motivation	210	3.05	0.70	Agree
27	Students with positive relationships with teachers are more engaged	210	2.96	0.72	Agree
28	Negative teacher-student relationships can decrease academic activities	210	2.87	0.74	Agree
29	Negative teacher-student relationships can decrease emotional and social development	210	2.60	0.79	Agree

Students with positive relationships with				
30	teachers tend to perform better academically	210	2.50	0.80
Grand Mean			2.80	Agree

The results presented in Table 6 reveal that respondents agreed that positive teacher-student relationships enhance academic engagement and performance, with a grand mean of 2.80.

Discussion

The findings of this study reveal that psychological and sociological factors influence students' academic activities in senior secondary school biology in Awka South Local Government Area. Respondents perceived self-concept as a major determinant of academic engagement and performance, with a grand mean of 2.94. Students with positive self-concept were more persistent, confident, and capable of applying problem-solving skills effectively. This aligns with García-Martínez et al. (2022), who reported that self-concept dimensions significantly predict performance in core subjects, and Kania, & Juandi (2023), who showed that self-concept and resilience jointly enhance motivation and achievement. Fostering positive self-beliefs may therefore be crucial in promoting engagement and excellence in biology.

Test anxiety was also identified as a critical factor, with a grand mean of 2.92. High anxiety was reported to reduce focus, confidence, and engagement during examinations, consistent Balogun (2017) who found that anxiety negatively impacts academic outcomes and that interventions can improve performance. Structured study-skill training and anxiety-management strategies may thus enhance students' concentration and achievement.

The perceived influence of intelligence quotient (IQ) on students' academic activities was evident (grand mean = 2.94), indicating that students with higher cognitive ability are more capable of reasoning, comprehension, and overcoming academic challenges. Respondents viewed students with higher IQs as better able to handle academic tasks. This aligns with Mulyani and Lubis (2024), although cognitive ability also interacts with non-cognitive factors such as self-concept and motivation, highlighting the need for holistic interventions.

Peer group was shown to have an influence on students' academic activities (grand mean = 2.90). Positive peer interactions were perceived to promote collaborative learning and engagement, while negative peer influence could

contribute to distraction and procrastination. This dual role is supported by Brierley and Reid (2022) and recent findings by Shao, Kang, Lu, Zhang, and Li (2024) which suggest that structured peer-learning and cooperative study groups can enhance students' engagement in Biology.

Interestingly, socio-economic status (SES) was perceived having no influence (grand mean = 2.36). Although students from higher SES backgrounds may have access to better resources, this advantage did not automatically translate into improved biology performance. This may reflect local schooling conditions, resource sharing, and the more salient impact of psychological and social factors, even though meta-analytic studies elsewhere indicate moderate SES effects (Hu et al., 2024)

Finally, teacher-student relationships were perceived to influence students' academic activities (grand mean = 2.80). Positive interactions were reported to enhance motivation, engagement, and academic performance, while negative relationships could impede emotional and academic development. These findings are consistent with Liu and Xiaonan (2024) and OECD (2023), emphasizing the importance of fostering supportive teacher-student relationships. Overall, the study shows that psychological factors self-concept, IQ, and test anxiety are primary determinants of academic activities, while social factors peer and teacher-student relationships play complementary roles. SES appears less influential but may still exert indirect effects. These findings suggest that interventions to enhance self-belief, manage anxiety, leverage positive peer interactions, and promote constructive teacher-student relationships could significantly improve students' engagement and performance in biology.

Conclusion

The study concludes that students' academic activities in senior secondary school biology in Awka South Local Government Area are influenced by both psychological and social factors. Self-concept, intelligence quotient, and test anxiety emerged as the most influential factors, shaping persistence, cognitive abilities, focus, and confidence. Peer group interactions and teacher-student relationships also play important roles in motivating engagement and collaboration, while socio-economic status was perceived as less immediately impactful. These findings underscore the need for a holistic approach to academic support that addresses both psychological and social dimensions of learning.

Recommendations

Based on the findings of this study, the following recommendations are proposed to enhance students' academic performance in senior secondary school Biology:

1. School counselors, class teachers, and administrators should promote positive self-concept among students through mentoring, counseling, and motivational programs to enhance persistence and problem-solving in Biology.
2. School counselors, subject teachers, and psychology specialists should implement strategies to manage test anxiety, including study-skills workshops, exam preparation training, and relaxation techniques to improve students' focus and confidence.
3. Class teachers, peer mentors, and student leaders should leverage peer learning by organizing structured study groups and collaborative projects to encourage knowledge sharing and emotional support.
4. School administrators, subject teachers, and professional development coordinators should foster supportive teacher-student relationships through professional development, positive classroom interactions, and student-centered teaching approaches.
5. School management, local education authorities, and policymakers should consider socio-economic factors in policy and school-level interventions to ensure all students have equitable access to resources, even if SES is less influential locally.
6. School counselors, subject teachers, and educational program coordinators should integrate holistic programs that combine cognitive skill development with psychological and social support to maximize students' academic performance in Biology.

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