PROSOCIAL BEHAVIOUR AND ACADEMIC INTEREST AS PREDICTORS OF ACADEMIC ACHIEVEMENT IN CHEMISTRY AMONG SECONDARY SCHOOL STUDENTS IN AWKA SOUTH LOCAL GOVERNMENT AREA

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Abstract

This study investigated prosocial behaviour and academic interest as predictors of academic achievement in Chemistry among secondary school students in Awka South Local Government Area. The study is guided by three research questions and three postulated research hypotheses. Participants were drawn from 10 randomly selected secondary schools in Awka South LGA. 260 Participants were selected through a simple random sampling technique consisting of 130 boys and 130 girls. The study adopted a cross-sectional survey design. Two research instruments were used in the present study, they are Prosocialness Scale (PS) and Academic Interest Scale for Adolescents (AISA). Analysis of data was conducted using the multiple regression statistic. Results indicate that prosocial behaviour and academic interest account for 24.4%% of variance in academic achievement ($R = .494$, $R^2 = .244$, $F(2, 257) = 41.47$, $p < .001$) indicating a strong joint prediction. Independently, prosocial behaviour significantly and positively predicts academic achievement in chemistry ($\beta = .239$, $P < .05$). Similarly, academic interest significantly and positively predicted academic achievement in Chemistry ($\beta = .417$, $P < .05$). Relative to research findings, it is recommended that teachers should receive professional development since they have a significant influence on students' prosocial behavior and academic interest. Schools should thus fund professional development initiatives that give educators the tools they need to inspire students, foster inclusive learning environments, and encourage group projects. Training sessions could concentrate on employing student-centered teaching methods, controlling group dynamics, and encouraging intrinsic drive

Keywords; Prosocial behaviour, Academic Interest, Achievement, Chemistry

Introduction

In the bustling academic landscape, success is not solely measured by intellectual prowess. The classroom, a microcosm of society, reveals a multifaceted relationship of factors that shape a student's journey. This study delves into the hidden currents beneath academic achievement, exploring the profound influence of prosocial behavior and intrinsic academic interest. We

investigate whether these seemingly disparate elements – acts of kindness, empathy, and a genuine curiosity for learning – truly predict a student's academic triumphs, paving way for a nuanced perspective on the multifaceted nature of educational success.

One of the instruments used to assist people change their behavior and become better citizens who would benefit society is education. According to the Federal Republic of Nigeria's (FRN, 2013) National Policy on Education, one of the objectives of education in Nigeria is the development of suitable skills, mental, physical, and social abilities and competencies to enable the individual to live in and make a positive contribution to society. Consequently, it is also possible to argue that a person's scientifically gained abilities and competencies can be used to constructively impact society. This suggests that without a solid scientific foundation, no country can advance significantly in terms of development. This scientific foundation is particularly evident in disciplines like chemistry, which plays a pivotal role in societal progress and practical applications in everyday life.

According to Jegede (2019), chemistry is a topic of universal interest in human development because of the practical applications of its knowledge that many pupils would encounter in their future lives. Ojokuku (2020) states that the use of natural materials and the production of synthetic ones are the focus of chemistry. Modern existence relies on the delivery of food, machinery, and materials, all of which are made possible by the strength of chemical research (Samuel, 2018). At the senior secondary school level, the goals of chemistry education are to demonstrate chemistry and its connection to industry, as well as the advantages and risks of chemistry in daily life, and to offer a comprehensive course for those who do not plan to pursue further education (Federal Ministry of Education, 2022).

Despite the undeniable importance of chemistry, students' performance in the Nigerian Senior School Certificate Examination (SSCE) has consistently demonstrated significant challenges. Analysis of the West African Examinations Council (WAEC) Chief Examiners' reports reveals a concerning trend. In 2021, the mean score for Chemistry Paper 2 plummeted to 29 with a standard deviation of 13.78, a stark decline from the 2017 mean score of 47 with a standard deviation of 13.78. Similarly, the 2021 mean score for Chemistry Paper 3 (24) with a standard deviation of 9.95 exhibited a marked deterioration compared to the 2020 mean score of 26 with a standard deviation of 8. This persistent under-performance not only hinders individual student's success but also fosters a climate of disengagement and apathy towards Chemistry.

While factors such as ineffective teaching methodologies, inadequate learning environments, insufficient infrastructure, parental influence, birth order, academic self-efficacy, study habits, and test anxiety have been extensively investigated by researchers (Olaniyi, 2019; Okoye & Onokpaunu, 2020; Ilo & Unachukwu, 2020) as contributing to suboptimal students' achievement in Chemistry within Anambra State, particularly in Awka South Local Government Area, the emergence of evolving technologies has introduced new complexities. The pervasive influence of technology, while offering numerous benefits, can also serve as a significant distraction, hindering students' focused engagement with academic pursuits and consequently impacting their academic performance. According to this study, academic interest and prosocial behavior may be important determinants of students' academic success in chemistry. The goal of this research is to better understand the many elements that influence students' achievement in this important subject area by examining how these variables interact.

Voluntary acts meant to help others or foster social harmony are referred to as prosocial behavior. According to Adepegba (2023), these behaviors cover a broad spectrum of actions, such

as lending a hand, sharing, contributing, collaborating, and volunteering. Promoting constructive social connections and community bonding, especially among young people, requires prosocial activity. Prosocial behavior may be driven by moral principles, empathy, or a desire for social acceptance (Solomon, 2015). According to Olukayode (2018), prosocial behavior is a category of social activity that includes sharing, volunteering, empathy, cooperation, and altruistic care for the welfare of others. Understanding the subtleties of prosocial behavior, which can appear in various circumstances, requires an awareness of these elements.

Research consistently demonstrates that adolescents, particularly those in secondary school, frequently exhibit prosocial behaviors. Studies by Quain et al. (2016) have highlighted the crucial role of various factors, including peer influence, family values, and the educational environment, in shaping the extent to which these prosocial behaviors are displayed. It is reasonable to assume that similar patterns exist within the Awka South Local Government Area of Anambra State. While specific research within this region may be limited, the strong cultural emphasis on prosocial behavior within Nigerian society, characterized by strong communal ties and a focus on collective well-being, likely fosters a supportive environment for these behaviors to flourish.

Furthermore, the display of cooperative behaviors within the classroom environment significantly contributes to a more positive and conducive learning atmosphere. When students actively collaborate and support each other, it fosters a sense of shared responsibility and encourages mutual respect. This collaborative spirit enhances communication and teamwork skills, enabling students to learn from each other and work together more effectively towards common academic goals. Gou et al. (2018) demonstrated that prosocial behaviour, whether self-reported or observed by peers, plays a crucial role in improving academic achievement. Another variable

examined in the present study to check for possible association with academic achievement is students' academic interest.

Interest is the kind of awareness inclination for understanding the world and acquiring cultural and scientific knowledge. When students are interested in a certain field, they may pay special attention to it, observing carefully, memorizing well and thinking actively. Only by arousing students' interest in learning Chemistry can we enhance students' enthusiasm for learning; help them master Chemistry conceptual knowledge and techniques better and form the scientific spirit and attitude. According Eze (2016) students with an interest in a subject like Chemistry are likely to be more motivated to manage their own learning and develop the requisite skills to become effective learners of Chemistry. Hence, interest in Chemistry is relevant when considering the development of effective learning strategies. In contrast, anxiety about learning Chemistry can act as a barrier to effective learning. Students who feel anxious about their ability to cope in Chemistry learning situations may avoid them and thus lose important career and life opportunities. Godpower-Echie and Ihenko (2017) opined that teachers should try to identify a teaching approach, method that can motivate or arouse students' interest.

According to Mazer (2010), students who are interested in a subject tend to pay more attention, concentrate better, feel better, and be more motivated to learn it. The psychological condition of engaging with or having the propensity to return to a specific piece of content over time is known as interest. Current interest theorists have distinguished three types of interest: academic, situational, and personal (Harackiewicz & Hulleman, 2010). A person's natural affinity or appreciation for an idea is known as personal interest. Over time, personal interest is more persistent and characteristic. One could think of it as a temperament that people carry with them from one situation to another. On the other hand, situational interest is the interest that is prompted

by the situational affiliation. Situational interest could emanate from a good and conducive learning environment, use of instructional materials, and application of appealing teaching approach or students-centered teaching approach. It is more momentary and depends on the environment s/he finds him- or herself. Situational interest is a student's emotional state triggered by the context and content's interest, and it is partially controlled by the teacher (Okafor, 2020). Academic interest is the type of interest that is essential to both situational and personal interest in order to accomplish educational goals. A student of chemistry, for example, who develops an innate or personal interest in the subject and experiences situational interest engagement—such as well-trained teachers, the integration of instructional material and method, and the teacher's personality trait—will ultimately achieve well academically (Onah, 2022).

Teacher’s ability to arouse student interest is essential for higher achievement. Interest is therefore the motivation in a learner which results in the option of object and activity that is enjoyable, profitable, and will ultimately bring complete satisfaction in itself (Serdyukov, 2017). According to some empirical research conducted in Nigeria, students' academic performance is significantly improved by interest. Onah and Achufusi (2022) found that a meta-conceptual teaching technique might increase students' interest, which in turn enhanced their academic performance. Once more, Okafor (2020) observed that academic interest might predict academic achievement up to 57% of the time, compared to 5% at first. Interest could predict roughly 21.6% of students' academic progress in Chemistry (Ezike, 2018). Although interest is driven by gender, gender by itself does not significantly predict accomplishment in Integrated Science, according to a gender-based study conducted by Godpower-Echie and Ihenko (2017). According to Wong and Wong (2019), interest is not a significant predictor of students who already succeed well; rather, it only has a significant and favorable impact on the achievement of low-achieving students. The

literature on studies that assess interest as a predictor of accomplishment among secondary school students in Awka South L.G.A. is lacking, despite the significance of interest for academic achievement. The purpose of this study is to determine the extent to which prosocial behaviour and students' interest predicts their chemistry achievement in Awka South L.G.A. secondary schools.

Statement of the Problem

Academic achievement in Chemistry among secondary school students in Nigeria is a persistent concern despite the subject's importance for STEM careers. While factors like teaching methods and resources have been studied, the influence of non-cognitive factors, specifically prosocial behaviour and academic interest, remains largely unexplored within the Nigerian educational context. Prosocial behaviour, involving actions that benefit others, has shown links to academic success elsewhere, but its relationship with Chemistry achievement in Nigeria is unclear. Similarly, while academic interest is known to predict academic success, its specific impact on Chemistry achievement among Nigerian students, particularly in Awka South Local Government Area, Anambra State, needs investigation. Existing research on Chemistry achievement in Nigeria has primarily focused on cognitive and institutional factors, neglecting the potential roles of socio-emotional and motivational aspects. Furthermore, studies from Western contexts may not be directly applicable to the unique cultural and educational landscape of sub-Saharan Africa. This study aims to address these gaps by examining how prosocial behaviour and academic interest predict academic achievement in Chemistry among Nigerian secondary school students. Understanding these non-cognitive factors can lead to interventions that promote them, ultimately improving Chemistry performance and supporting STEM education development in Nigeria.

Purpose of the Study

The current study's primary objective is to find out how prosocial behaviour and academic interest predict academic achievement in Chemistry among secondary school students in Awka-South L.G.A, Anambra State. In particular, this research aims to examine:

1. Prosocial behaviour as a predictor of academic achievement in Chemistry among secondary school students.
2. Academic interest as a predictor of academic achievement in Chemistry among secondary school students.
3. Prosocial behaviour and academic interest as joint predictors of academic achievement in Chemistry among secondary school students.

Research Questions

The following research questions guided the study

1. What is the predictive role of prosocial behaviour on academic achievement in Chemistry among secondary school students?
2. What is the predictive role of academic interest on academic achievement in Chemistry among secondary school students?
3. What is the joint predictive role of prosocial behaviour and academic interest on academic achievement in Chemistry among secondary school students?

Hypotheses

1. Prosocial behaviour will not significantly predict academic achievement in Chemistry among secondary school students.

2. Academic interest will not significantly predict academic achievement in Chemistry among secondary school students.
3. Prosocial behaviour and academic interest will not jointly and significantly predict academic achievement in Chemistry among secondary school students.

Methods

The research design used in the study was a cross-sectional survey. Data from a sample of participants is gathered at one particular moment in time as part of a cross-sectional study design. Participants were drawn from secondary school students in Awka South Local Government Area. All senior secondary year two (SS2) students from the 19 public secondary schools in Awka South Local Government Area of Anambra State made up the study's population. SS II students were chosen because, in contrast to SS III, they do not take major external examinations; however, any academic achievement gaps found in SS II students could be addressed before the students are fully prepared for the annual WAEC and NECO exams in SS III. Using a simple random sampling technique, 10 schools were selected out of the 19 public secondary schools in Awka South Local Government Area of Anambra State. The researcher then randomly selected 26 students each from these selected 10 public schools in Awka South L.G.A using ballot system. This gives a total of 260 participants. Two research instruments were used in the present study to measure the constructs in the study. These instruments include: Prosocialness Scale by Caprara et al. (1998) and Academic Interest Scale for Adolescents by Lou et al. (2019). The academic achievement test was measured using the term's score of Chemistry students made available by their Subject teachers. These scores were used to measure their achievement levels. The Prosocialness Scale (PS) demonstrated excellent internal consistency with a Cronbach's alpha coefficient of $\alpha = .84$. Similarly, the Academic Interest Scale for Adolescents (AISA) exhibited strong internal

consistency, achieving a Cronbach's alpha coefficient of $\alpha = .80$. Data collected from participants was analyzed using the multiple regression statistical method.

Results

This section presents the summary of the study analysis on prosocial behavior and academic interest as predictors of academic achievement among secondary school chemistry students.

Table 1: Summary Table of the Mean and Standard deviations: A descriptive statistics.

Variable	Mean	SD	N
Academic Achievement	55.63	13.577	260
Prosocial Behaviour	18.81	6.010	260
Academic Interest	51.90	17.512	260

Table 1 presents the descriptive statistics for the study variables. The sample comprised 260 secondary school chemistry students in Awka South Local Government Area. The mean score for academic achievement was 55.63 with a standard deviation of 13.58. The mean score on the prosocial behavior scale was 18.81, with a standard deviation of 6.00. Finally, the mean score on the academic interest scale was 51.90, with a standard deviation of 17.51. These descriptive statistics provide a preliminary overview of the distribution of scores for each variable within the study sample.

Research Question 1: What is the predictive role of prosocial behaviour on academic achievement in Chemistry among secondary school students in Awka South L.G.A?

Table 2: Regression Table, showing the predictive role of prosocial behaviour on academic achievement in Chemistry among secondary school student in Awka South L. G. A.

Variable	Beta (β)	t	*P.* value	N
Prosocial behaviour	.239	4.406	.000	260

Dependent variable: Academic Achievement

The findings presented in **Table 2** revealed a statistically significant and positive predictive relationship between prosocial behavior and academic achievement among the secondary school Chemistry students in Awka South Local Government Area. The regression analysis indicated a standardized beta coefficient (β) of .239 ($p < .05$), signifying a moderate positive association. This finding provides compelling evidence that higher levels of prosocial behavior are significantly associated with increased academic success among these students.

Hypothesis 1: Prosocial behaviour will not significantly predict academic achievement in Chemistry among secondary school students in Awka south L. G. A.

Results depicted in **Table 2** reveal that prosocial behaviour significantly and positively predicted academic achievement in Chemistry among students. Based on this observation, the null hypothesis stating that "Prosocial behaviour will not significantly predict academic achievement in Chemistry among secondary school students in Awka south L. G. A." is hereby not Rejected.

Research Question 2: What is the predictive role of academic interest on academic achievement in Chemistry among secondary school students in Awka South L.G.A?

Table 3: Regression table, showing the predictive role of academic interest on academic achievement in Chemistry among secondary school student in Awka South L. G. A.

Variable	Beta (β)	t	*P.* value	N
Academic interest	.417	7.667	.000	260

Dependent variable: Academic Achievement

The regression analysis, as depicted in **Table 3**, revealed a statistically significant and positive predictive relationship between academic interest and academic achievement in Chemistry among the secondary school students in Awka South Local Government Area. A standardized beta coefficient (β) of .417 ($p < .05$) was observed, indicating a moderate to strong

positive association. These findings strongly suggest that higher levels of academic interest are significantly correlated with enhanced academic success within this student population

Hypothesis 2: Academic interest will not significantly predict academic achievement in Chemistry among secondary school students in Awka south L. G. A.

Research findings in **Table 3** suggests that academic interest significantly and positively predicted academic achievement in chemistry among secondary school students. Based on this observation, the null hypothesis stating that "academic interest will not significantly predict academic achievement in Chemistry among secondary school students in Awka south L.G.A." is hereby Rejected

Research Question 3: What is the joint predictive role of prosocial behaviour and academic interest on academic achievement in Chemistry among secondary school students in Awka South L.G.A?

Table 4: Multiple regression model showing the joint predictive role of prosocial behaviour and academic interest on academic achievement in Chemistry among secondary school students in Awka South L.G.A

R	R^2	Adjusted R^2	Std. error	Durbin Watson	df	F value	Sig.
.494	.244	.238	11.85	2.183	2/257	41.47	.000

Dependent variable: Academic achievement

Predictors: Academic interest, Prosocial behaviour

Multiple regression analysis (Enter Method) revealed that the combined effect of prosocial behavior and academic interest significantly predicted academic achievement among the secondary school Chemistry students. The model, as shown in **Table 4**, accounted for 24.4% of the variance in academic achievement ($R = .494$, $R^2 = .244$, $F(2, 257) = 41.47$, $p < .001$), indicating a strong predictive power.

Hypothesis 3: Prosocial behaviour and academic interest will not jointly and significantly predict academic achievement among secondary school chemistry students in Awka South L.G.A

Based on findings in **Table 4**, prosocial behaviour and academic achievement jointly and significantly predicts academic achievement among secondary school chemistry students in Awka South L.G.A. Hence, the third hypothesis which states that "Prosocial behaviour and academic interest will not jointly and significantly predict academic achievement among secondary school chemistry students in Awka South L.G.A" is hereby rejected

Discussion of Findings

In response to research question 1, the data analysis presented in Table 2 reveals that prosocial behaviour significantly predicts the academic achievement in chemistry among secondary school students. This finding led to the rejection of the hypothesis stating, "Prosocial behaviour will not significantly predict academic achievement in Chemistry among secondary school students." The positive relationship suggests that students who exhibit higher levels of prosocial behaviour are more likely to achieve better academic results, while a decline in prosocial behaviour is associated with poorer academic Achievement. This result aligns with the findings of Gou et al. (2018), who demonstrated that prosocial behaviour, whether self-reported or observed by peers, strongly predicts improved academic achievement. However, Shirin (2020) reported a weaker correlation between prosocial behaviour and academic achievement, though qualitative insights from their study highlighted the potential role of cooperation and collaboration—key aspects of prosocial behaviour—in fostering academic success. Interestingly, Limos et al. (2024) found that while prosocial actions did not significantly correlate with academic achievement, prosocial feelings were positively linked to academic achievement

Regarding research question 2, the data analysis in Table 3 indicates that academic interest significantly and positively predicts academic achievement in Chemistry among secondary school students. This positive relationship implies that students with a strong academic interest tend to achieve higher academic scores, whereas those with lower interest levels tend to perform poorly. Consequently, the hypothesis stating, "Academic interest will not significantly predict academic achievement in Chemistry among secondary school students," was rejected. This finding is consistent with the work of Onah et al. (2022), who found that academic interest significantly contributed to the academic achievement of secondary school Physics students. Similarly, Mappadang et al. (2020) identified academic interest as a key determinant of academic achievement, surpassing the influence of students' learning attitudes and quality.

Research question 3 explored the combined predictive role of prosocial behaviour and academic interest on the academic achievement in Cheminstry among secondary school students. The study found that these two variables jointly predict academic achievement, accounting for 24.4% of the variation in students' academic performance. This result led to the rejection of the third hypothesis, which stated, "Prosocial behaviour and academic interest will not jointly and significantly predict academic achievement in Chemistry among secondary school students." This finding aligns with Deci and Ryan's (1985) Self-Determination Theory (SDT). According to SDT, academic interest, as a form of intrinsic motivation, thrives when students experience autonomy (a sense of control over their learning), competence (confidence in their academic abilities), and relatedness (connection to peers and teachers). For instance, when students find personal meaning and enjoyment in their studies, they are more likely to engage deeply and excel academically. Similarly, prosocial behaviour, which involves actions aimed at benefiting others, fulfills the need for relatedness by fostering positive social interactions. For example, helping peers or

collaborating on group projects can strengthen social bonds and contribute to a supportive learning environment, further enhancing academic achievement.

Conclusion

In conclusion, this study shows that both prosocial behaviour and academic interest play important roles in shaping the academic achievement of secondary school Chemistry students. The results indicate that students who display more prosocial behaviours, such as helping others and working collaboratively, tend to perform better academically. Similarly, students with a strong interest in their studies are more likely to achieve higher grades compared to those who are less interested. Together, these two factors—prosocial behaviour and academic interest—explain about 24.4% of the differences in students' academic performance. These findings support Deci and Ryan's (1985) Self-Determination Theory, which highlights the importance of feeling connected, competent, and in control of one's learning as key drivers of success.

This research adds to our understanding of what influences academic achievement, particularly in the Nigerian context, and offers practical insights for educators and policymakers aiming to support students' growth and success

Recommendation

Based on the findings of this study, the following recommendations were proposed to enhance academic achievement among secondary school Chemistry students:

1. By including peer mentoring programs, group projects, and cooperative activities into the curriculum, Teachers can actively encourage prosocial behavior in their students. In addition to fostering a sense of community, teachers can improve academic achievement by giving

students opportunity to collaborate, exchange knowledge, and support one another. Administrators in schools could also host seminars or campaigns to increase understanding of the value of prosocial behavior and how it affects education.

2. Teachers should use instructional strategies that make learning more dynamic, relevant, and pleasurable in order to increase students' interest in chemistry and other disciplines. To make lessons more interesting, this can entail utilizing technology-based resources, practical activities, and real-world examples. In order to assist students, comprehend the importance and relevance of what they are learning, teachers should also make an effort to relate the material to their individual interests and long-term objectives.
3. Teachers should receive professional development since they have a significant influence on students' prosocial behavior and academic interest. Schools should thus fund professional development initiatives that give educators the tools they need to inspire students, foster inclusive learning environments, and encourage group projects. Training sessions could concentrate on employing student-centered teaching methods, controlling group dynamics, and encouraging intrinsic drive.
4. Although this study offers insightful information, more investigation is required to examine the connection between academic achievement, prosocial behavior, and academic curiosity in other cultural and educational situations. Future research could look into how these factors affect students' academic paths and employment decisions at the long run. Researchers should also look at how other elements, such as socioeconomic status, school resources, and family participation, affect these results. This would guide focused actions and contribute to a more thorough knowledge of the elements affecting academic success.

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