



Study Habits as Correlate of Senior Secondary School Students' Attitude and Achievement in Chemistry in Federal Capital Territory, Abuja, Nigeria

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ABSTRACT

This study investigated study habits as correlates of senior secondary school students' attitudes and achievement in Chemistry in the Federal Capital Territory (FCT), Abuja, Nigeria. A correlational survey research design was adopted. The study population comprised 10,440 Senior Secondary II Chemistry students in 90 public senior secondary schools across the six Area Councils of the FCT. A multistage sampling procedure was used to select students from six public senior secondary schools in three Area Councils. The study used the Study Habits Inventory (SHI), Chemistry Attitudes Scale (CAS), and Chemistry Academic Achievement Data (CAAD). Face and content validity were established through expert review, while reliability coefficients reported in the thesis were 0.82 for SHI and 0.87 for CAS. Data were analysed using frequency counts, means, standard deviations, and Pearson Product Moment Correlation Coefficient with SPSS. The findings indicated no statistically significant relationship between study habits and Chemistry achievement, whereas study habits were significantly and positively related to students' attitudes toward Chemistry. Gender-disaggregated results showed no significant relationship between study habits and achievement for either male or female students, but significant positive relationships existed between study habits and attitudes for both groups. Based on the findings, the study recommended, among others, that Chemistry teachers should integrate laboratory activities, inquiry-based learning and everyday chemical demonstrations to improve students' understanding and achievement and school principals and guidance counsellors should provide compulsory, termly study-skills workshops to promote effective study habits and positive attitudes toward Chemistry. The study concludes that study habits may be more directly associated with students' affective orientation toward Chemistry than with achievement scores when other school and environmental conditions are not addressed.

Keywords: Study Habits; Attitudes; Academic Achievement; Chemistry; Senior Secondary School.

INTRODUCTION

Chemistry is a central component of science education because it explains the composition, properties, interactions, and transformations of matter. It provides foundational knowledge for professional fields such as medicine, pharmacy, engineering, agriculture, environmental science, and chemical technology. In Nigeria, Chemistry is taught at the senior secondary school level and is required for admission into many science- and technology-related programmes. Consequently, students' achievement and attitudes toward Chemistry are important concerns for teachers, school administrators, parents and education policymakers (National Policy on Education, 2014; Twoli, 2016).

Despite the importance of Chemistry, persistent concerns have been raised about students' weak achievement and unfavourable attitudes in the subject. The study associates poor outcomes with interacting factors such as ineffective instructional practices, inadequate laboratory facilities, insufficient learning resources, motivation, attitudes and study habits. Similar concerns have been discussed in the Chemistry education literature, where



the quality of teaching methods, practical experiences, instructional materials and the learning environment are considered important influences on learning outcomes (Abulude, 2016; Twoli, 2016).

Study habits refer to the regular practices through which learners organise, carry out, monitor and revise their academic work. They include time allocation, reading routines, note-taking, revision, concentration, self-testing and the use of conducive learning environments. The literature presents study habits as behavioural routines that may be strengthened through repetition and purposeful guidance. Effective study habits can support self-discipline, regular revision, retention and the application of knowledge (Crede & Kuncel, 2018; Ogbodo, 2020).

Students' attitudes toward Chemistry constitute another important dimension of learning. Attitude includes learners' feelings, beliefs, impressions, interests and behavioural dispositions toward Chemistry and Chemistry-related tasks. A positive attitude may support persistence, participation, confidence, and willingness to engage with abstract concepts, whereas negative attitudes may be associated with avoidance, anxiety, and reduced engagement. Studies have indicated that attitudes and achievement are influenced by classroom organisation, instructional strategies, laboratory experiences, teacher support, and the wider learning environment (Twoli, 2016; Iyiola & Ezeh, 2024). However, a favourable attitude does not automatically guarantee high achievement because students' learning opportunities and the quality of their engagement may differ across contexts.

The study is also situated within a gender-related discussion. Previous research has reported inconsistent findings concerning gender differences in science attitudes and achievement. Some studies have identified gender-related differences in Chemistry performance or the relationship between study habits and performance, while broader reviews caution against treating gender as a single or sufficient explanation for students' learning outcomes (Murphy & Whitelegg, 2016; Jamilu et al., 2020). Family background, institutional support, classroom experiences, study routines, and self-confidence may also contribute to observed differences (Osuafor & Ijenwa, 2017).

Against this background, the present study examined the relationships among study habits, attitudes toward Chemistry, and Chemistry achievement among Senior Secondary II students in public senior secondary schools in the FCT, Abuja. The study further examined whether the observed relationships differed for male and female students. The focus is consistent with previous Nigerian studies that have investigated study habits as correlates or predictors of achievement in science subjects (Ajai et al., 2020; Ebele & Olofu, 2017; Egbujuo & Ajagun, 2019; Enyi, 2023; Uche, 2020).

Research Questions

1. What is the correlation between students' study habits and their achievement in Chemistry?
2. What is the relationship between students' study habits and their attitudes toward Chemistry?
3. What is the correlation between study habits and academic achievement of male and female students in Chemistry?
4. What is the correlation between study habits and attitudes of male and female students in Chemistry?

Hypotheses

The following null hypotheses were tested at the 0.05 level of significance:

H₀₁: There is no significant correlation between students' study habits and their achievement in Chemistry in FCT senior secondary schools.

H₀₂: There is no significant relationship between students' study habits and their attitudes toward Chemistry.

H₀₃: There is no significant correlation between male students' study habits and their Chemistry achievement.

H₀₄: There is no significant correlation between male students' study habits and their attitudes toward



Chemistry.

H₀₅: There is no significant correlation between female students' study habits and their Chemistry achievement.

H₀₆: There is no significant correlation between female students' study habits and their attitudes toward Chemistry.

METHODOLOGY

The study adopted a correlational survey research design. The design was considered appropriate because the study sought to determine the direction and degree of relationships among study habits, attitudes toward Chemistry, and academic achievement without manipulating the variables. The population comprised 10,440 Senior Secondary II Chemistry students in 90 public senior secondary schools distributed across the six Area Councils of the Federal Capital Territory, Abuja. Senior Secondary II students were selected because they had acquired foundational knowledge of Chemistry but were not yet fully engaged in the terminal external examination class.

A sample of 370 Chemistry students was drawn from six public senior secondary schools in three Area Councils. A multistage sampling procedure was used. The Area Councils were first stratified, after which three Area Councils were selected through simple random sampling using the hat-and-draw method. Two schools were then selected from each chosen Area Council. SS II Chemistry students were selected within the schools, and proportionate sampling was used to ensure representation based on the student population of each school. The reported sample comprised male and female students.

Three instruments were used. The Study Habits Inventory (SHI) contained 20 items on a four-point Likert scale ranging from Strongly Agree to Strongly Disagree. Positively worded items were scored from 4 to 1, while negatively worded items were reverse-scored. The Chemistry Attitudes Scale (CAS) also contained 20 four-point Likert items designed to measure students' positive or negative attitudes toward Chemistry. Chemistry Academic Achievement Data (CAAD) consisted of students' most recent Chemistry examination scores obtained from school records. The instruments were subjected to face and content validation by experts in science education and educational measurement, including specialists from higher education institutions and an experienced Chemistry teacher. The experts examined the clarity of instructions, appropriateness of the items, coverage of the research questions, and relevance to the objectives of the study. A pilot study involving 30 students who were excluded from the main study was conducted. The thesis reports a reliability coefficient of 0.82 for the Study Habits Inventory and 0.87 for the Chemistry Attitudes Scale.

The researcher obtained an introductory letter and permission from the relevant education authority and the principals of the selected schools. Two research assistants were briefed on the administration procedure. The SHI and CAS were administered to the selected students, who completed the instruments independently. The completed instruments were checked for completeness and consistency. The researcher also obtained students' most recent Chemistry examination scores from school records. Means and standard deviations were used to describe the data and answer the research questions. Pearson Product Moment Correlation Coefficient was used to test the hypotheses at the 0.05 significance level. The analysis was conducted using the Statistical Package for the Social Sciences (SPSS), version 25.0.

Results

Table 1: Summary of the Correlation between Study Habits, Attitudes toward Chemistry, and Chemistry Achievement

Relationship	Correlation (r)	Significance	Decision
Study habits-Chemistry Achievement (Overall)	0.094	p = 0.070	Not significant



Study habits-attitudes toward Chemistry (Overall)	0.834	$p < 0.001$	Significant positive relationship
Male study habits-Chemistry Achievement	-0.124	$p = 0.099$	Not significant
Female study habits-Chemistry Achievement	-0.023	$p = 0.075$	Not significant
Male study habits-attitudes toward Chemistry	0.77	$p < 0.001$	Significant positive relationship
Female study habits-attitudes toward Chemistry	0.87	$p < 0.001$	Significant positive relationship

Hypothesis One: Relationship between Study Habits and Chemistry Achievement

The first hypothesis examined the relationship between study habits and Chemistry achievement among Senior Secondary II students in the FCT, Abuja. The result in Table 1 indicated a very weak positive correlation between study habits and Chemistry achievement ($r = 0.094$, $p = 0.070$). Since the probability value was greater than the 0.05 level of significance, the relationship was not statistically significant. Therefore, the null hypothesis was not rejected. This finding implies that students' study habits were not significantly associated with their Chemistry achievement in the study population. Although the direction of the relationship was positive, the weak correlation suggests that other factors, such as instructional strategies, laboratory experiences, learning resources, motivation, and prior knowledge, may also be relevant to students' achievement in Chemistry.

Hypothesis Two: Relationship between Study Habits and Attitudes toward Chemistry

The second hypothesis investigated the relationship between study habits and students' attitudes toward Chemistry. The result in Table 1 showed a strong positive correlation ($r = 0.834$, $p < 0.001$). Since the probability value was less than the 0.05 level of significance, the relationship was statistically significant. Consequently, the null hypothesis was rejected. This finding indicates that students with more favourable study habits tended to report more positive attitudes toward Chemistry. The result suggests that regular study routines, effective time management, revision, concentration, and engagement with learning activities may be associated with students' affective dispositions toward Chemistry. However, because the study adopted a correlational design, the result does not establish that study habits directly caused students to develop positive attitudes.

Hypothesis Three: Relationship between Male Students' Study Habits and Chemistry Achievement

The third hypothesis examined the relationship between study habits and Chemistry achievement among male students. The analysis Table 1 produced a weak negative correlation ($r = -0.124$, $p = 0.099$). Since the probability value exceeded the 0.05 significance level, the relationship was not statistically significant. Therefore, the null hypothesis was not rejected. This result indicates that study habits were not significantly related to Chemistry achievement among male students in the sample. The negative direction of the correlation suggests a slight inverse association, but the weak magnitude and non-significant probability value mean that this pattern should not be interpreted as a meaningful or dependable relationship in the study population.

Hypothesis Four: Relationship between Female Students' Study Habits and Chemistry Achievement

The fourth hypothesis investigated the relationship between study habits and Chemistry achievement among female students. The result in Table 1 revealed a very weak negative correlation ($r = -0.023$, $p = 0.075$). Since the probability value was greater than 0.05, the relationship was not statistically significant. Accordingly, the null hypothesis was not rejected. The finding suggests that variations in female students' study habits were not significantly associated with their Chemistry achievement in the present study. Although the correlation was negative, its magnitude was extremely small, indicating little evidence of a meaningful linear relationship between the two variables. Other academic, instructional, and contextual factors may therefore have contributed to differences in the students' Chemistry achievement.



Hypothesis Five: Relationship between Male Students' Study Habits and Attitudes toward Chemistry

The fifth hypothesis examined the relationship between male students' study habits and their attitudes toward Chemistry. The result in Table 1 showed a strong positive correlation ($r = 0.77$, $p < 0.001$). Because the probability value was less than the 0.05 level of significance, the relationship was statistically significant. Consequently, the null hypothesis was rejected. This finding indicates that male students with more favourable study habits tended to demonstrate more positive attitudes toward Chemistry. The result may suggest that organised study routines and sustained academic engagement are associated with greater interest, confidence, and favourable dispositions toward Chemistry among male students. Nevertheless, the correlation should be understood as an association rather than evidence of a direct causal effect.

Hypothesis Six: Relationship between Female Students' Study Habits and Attitudes toward Chemistry

The sixth hypothesis investigated the relationship between female students' study habits and their attitudes toward Chemistry. The analysis in Table 1 revealed a strong positive correlation ($r = 0.87$, $p < 0.001$). Since the probability value was below the 0.05 significance level, the relationship was statistically significant. Therefore, the null hypothesis was rejected. The finding suggests that female students who reported more favourable study habits also tended to express more positive attitudes toward Chemistry. This relationship may reflect the association between organised academic practices, self-regulation, confidence, and students' willingness to engage with Chemistry learning activities. Although the correlation coefficient was higher than that reported for male students, the result should not be interpreted as evidence that gender alone determines students' attitudes or study habits.

DISCUSSION OF FINDINGS

The finding that study habits were not significantly related to Chemistry achievement ($r = 0.094$, $p = 0.070$) indicates that study routines alone did not explain differences in students' examination performance in the present sample. This finding is not fully consistent with studies that reported positive associations between study habits and academic achievement among secondary school learners (Ebele & Olofu, 2017; Ajai et al., 2020; Uche, 2020). It is, however, compatible with the argument that achievement is multidimensional and may also depend on the quality of instruction, practical opportunities, learning resources, prior knowledge, motivation, and the home environment (Abulude, 2016; Twoli, 2016; Osuafor & Ijenwa, 2017). The difference between the present result and some earlier findings may reflect differences in research context, sample characteristics, measurement instruments, or the specific dimensions of study habits examined.

Chemistry learning requires conceptual reasoning, practical activities, symbolic representation, and problem-solving. Therefore, the frequency with which students study may not be equivalent to the effectiveness or quality of their study. Crede and Kuncel (2018) emphasised that study skills, habits, and attitudes function as related but distinguishable components of academic functioning. Accordingly, students may report regular study practices without necessarily using strategies that promote deep conceptual understanding, retrieval, transfer, and practical application. This interpretation provides one possible explanation for the weak and non-significant correlation observed in the present study, although the correlational design does not permit a causal conclusion.

The reported positive relationship between study habits and attitudes toward Chemistry suggests that students who described themselves as more organised and consistent in their study practices also tended to report more favourable attitudes toward the subject. This result is broadly consistent with the view that effective study routines can strengthen confidence, persistence, self-regulation, and engagement (Crede & Kuncel, 2018; Ogbodo, 2020). It also corresponds with the emphasis placed by Iyiola and Ezeh (2024) on students' attitudes as an important factor in Chemistry learning. Nevertheless, the exact overall correlation requires verification because the thesis reports $r = 0.834$ in one section and $r = 0.083$ in another section. The original SPSS output should therefore be consulted before the result is presented as final.

The gender-specific findings showed that study habits were not significantly related to Chemistry achievement



among either male or female students, whereas positive relationships with attitudes were reported for both groups. The attitude results are consistent with the general argument that study routines may be related to affective engagement even when they do not translate directly into higher examination scores. The pattern also illustrates why gender should be interpreted cautiously. Although Jamilu et al. (2020) examined study habits and gender in relation to Chemistry performance, Murphy and Whitelegg (2016) noted that gender-related patterns in science education are complex and may be shaped by social, classroom, and institutional factors. The present findings should therefore not be interpreted as evidence that gender independently determines Chemistry achievement.

Overall, the findings support a multidimensional approach to improving Chemistry learning. Students may need guidance in time management, note-taking, revision, retrieval practice, self-assessment, and structured approaches such as SQ3R (Ogbodo, 2020). At the same time, schools need to strengthen instructional quality, laboratory access, teacher support, and the availability of relevant learning resources (Abulude, 2016; Twoli, 2016). The present findings partly support previous literature on the relevance of study habits to students' attitudes, but they do not support the assumption that study habits necessarily have a significant direct relationship with Chemistry achievement in every educational context.

CONCLUSION

Based on the findings, the study concludes that study habits were not significantly correlated with Chemistry achievement among Senior Secondary II students in public senior secondary schools in the FCT, Abuja. However, study habits were significantly and positively associated with students' attitudes toward Chemistry. The same pattern was observed among male and female students: study habits were not significantly related to achievement but were significantly related to attitudes. The findings imply that cultivating effective study habits may support students' interest, confidence and positive disposition toward Chemistry, but such habits should be complemented by improvements in teaching, learning resources, practical experiences and school conditions.

RECOMMENDATIONS

Based on the findings from this study, the following recommendations were made:

1. Chemistry teachers should integrate laboratory activities, inquiry-based learning and everyday chemical demonstrations to improve students' understanding and achievement.
2. School principals and guidance counsellors should provide compulsory, termly study-skills workshops to promote effective study habits and positive attitudes toward Chemistry.
3. Teachers should relate abstract Chemistry concepts to everyday experiences and societal applications to strengthen students' interest and enthusiasm for the subject.
4. The FCT Secondary Education Board and the Federal Ministry of Education should fund the rehabilitation of laboratories and provide modern reagents and essential instructional materials in public secondary schools.
5. School authorities should provide professional training for Chemistry teachers to eliminate gender bias and ensure equal access to laboratory equipment, classroom participation, and learning opportunities for male and female students.

REFERENCES

1. Abulude, F. O. (2016). Students' poor performance in Chemistry: Causes and remedies. *Journal of Education and Human Development*, 5(1), 1–10.
2. Ajai, J. T., Shiaki, B. O., & Bulus, T. C. (2020). Study habits and academic achievement: A case study of secondary school science students in the Jalingo metropolis, Taraba State, Nigeria. *American Journal of Educational Research*, 8(5), 282–285. <https://doi.org/10.12691/education-8-5-9>
3. Bashir, I., & Mattoo, N. H. (2022). A study on study habits and academic performance among adolescents (14–19 years). *International Journal of Social Science Tomorrow*, 5(1), 1–5.



4. Crede, M., & Kuncel, N. R. (2018). Study habits, skills, and attitudes: The third pillar supporting collegiate academic performance. *Perspectives on Psychological Science*, 3(6), 425–453.
5. Ebele, K., & Olofu, G. (2017). Study habit and its impact on secondary school students' academic performance in Biology in the Federal Capital Territory, Abuja. *Journal of Education Research and Reviews*, 12(10), 583–588.
6. Egbujuo, C. J., & Ajagun, G. (2019). Measures of students' study habit as predictors of academic achievement in chemistry. *Benue State University Journal of Educational Management (BSUJEM)*, 1(2), 190–201.
7. Enyi, N. C. (2023). Impact of secondary school students' study habits as correlates of their achievement in Chemistry in Udi LGA of Enugu State. *Journal of Education and Social Sciences*, 6(2), 44–56.
8. Iyiola, B. F., & Ezech, D. N. (2024). Students' attitudes and gender as determinants of colleges of education students' academic achievement in Chemistry. *Lafia Journal of Science and Innovative Research*, 8(1), 112–126.
9. Jamilu, U., Chado, A. M., & Shittu, K. O. (2020). Study habits and gender as a determinant of Chemistry performance among senior secondary school students in Minna Metropolis, Niger State. *Journal of Science, Technology, Mathematics and Education*, 16(1), 180–185.
10. Murphy, P., & Whitelegg, E. (2016). Gender and science education: A review of the literature. *International Journal of Science Education*, 38(1), 1–23.
11. National Policy on Education. (2014). Federal Republic of Nigeria.
12. Ogbodo, R. O. (2020). Effective study habits in the educational sector: *Counselling implications*. *Edo Journal of Counselling*, 3(2), 229–239.
13. Osuafor, A., & Ijenwa, O. (2017). Influence of family background on academic achievement of secondary school science subjects. *Journal for Cross-disciplinary Subject in Education*, 5(4), 2649–2655.
14. Twoli, N. W. (2016). Teaching and learning Chemistry in secondary schools: A review of methods and strategies. *Journal of Education and Human Development*, 5(1), 1–12.
15. Uche, K. (2020). Relationship between study habits and academic achievement of secondary school II students in Chemistry in Aguata Local Government Area of Anambra State. *SSRN Electronic Journal*. <https://doi.org/10.2139/ssrn.3712855>
16. West African Examinations Council. (2016, 2018, 2020, 2022). Senior School Certificate Examination statistics.