

RELATIONSHIP BETWEEN SECONDARY SCHOOL STUDENTS' STUDY HABIT AND THEIR ACADEMIC ACHIEVEMENT IN MATHEMATICS IN GOMBE STATE, NIGERIA

Achufusi Aka Ngozi, N. (Ph.D) & Ethel Chika Emenike

Department of science Education, Nnamdi Azikiwe university, Awka

07032659366

Abstract

In Gombe State, achievement of students in Mathematics in WASSCE had been consistently unsatisfactory based on WAEC Chief Examiners' Report in 2020, 2021 2022. This worrisome trend could probably be linked to the study habits of students in the subject. The purpose of the study was to ascertain the relationship between secondary school students' study habit and their academic achievement in mathematics in Gombe State. Five research questions guided the study while three hypotheses were tested at 0.05 level of significance. Correlational research design was used for the study. The population of this study comprised all the 5, 161 (3, 343 males and 1818 females) Senior Secondary two (SS2) students in all the 71 government-owned secondary schools in Gombe North Education Zone. The sample of the study was made up of 1330 SS 2 students for the 2022/2023 academic session which was made up of 824 males and 506 females obtained via simple random sampling and proportionate sampling techniques. Study Habits Inventory (SHI) and students past annual records in mathematics promotion examination obtained from the sampled schools was used for data collection. The reliability of SHI was tested using Cronbach Alpha method. Coefficient value of 0.88 was obtained which was considered high enough to confirm the instrument as reliable. Data collected were analyzed using Pearson product moment correlation coefficients and t-test of correlation. The finding of the study indicated that a high positive and significant relationship existed between students' study habits and their achievement in Mathematics. Again, the findings of the study showed that across gender lines, a positive and significant relationship existed between students' study habits and their achievement in Mathematics. It was recommended among others that Mathematics teachers should evolve teaching strategies that will sustain students' study habits in order to enhance their academic achievement in Mathematics.

Key words: Mathematics, Study Habit, Academic Achievement.

Introduction

Education is quite vital in any given society. It is the corner-stone for development. It is a process that promotes the development of the intellectual, emotional, social and physical capabilities of an individual. Ukeje (2012) noted that, education is a process by which any society through schools, colleges, universities and other institutions make deliberate efforts towards the transmission of knowledge, values and skills to the young ones. The schools could be primary, secondary or tertiary.

Secondary school is the next level of education after the primary school. It is the education level at which children within the age of 12 to 18 years are exposed after primary education and before tertiary education. Secondary education prepares students for meaningful living as well as further education. The underlining principle here is that secondary school should be able to provide quality secondary education to all those who can benefit from it. In the course of secondary education, several core subjects are taught mathematics inclusive.

Mathematics is a physical science that deals with quantities, forms, shapes and their relationships by the use of numbers and symbols. Singh (2015) defined mathematics as the gate and key of all sciences. Singh added that it is a theoretical discipline that deals with the possible relationships among abstractions with no recourse to apprehension for whether those abstractions have counterparts in the real world. According to Muraina (2013), Mathematics is nurtured by certain qualities such as power of reasoning, creativity, abstract or spatial thinking, critical thinking, problem-solving ability as well as effective communication skills.

In Nigeria, Mathematics is one of the core science subjects in secondary school curriculum. Like other subjects, much emphasis is placed on the teaching and learning secondary school Mathematics. This is to be able to achieve the goal of education as it is spelled out in secondary school curriculum that mathematics is taught as core subject due to its relevance to individual and society at large. Mathematics syllabus is designed to enable the learner to acquire attitudes, skills and knowledge that will be relevant to his or her life after school. Mathematics is a core subject that is key to the understanding of other fields of science and technology and for gaining admission into tertiary institutions in Nigeria (Melvina and Nanjwan, 2019). In recognition of the afore-mentioned, the achievement of students in mathematics should be treated with every sense of seriousness.

Academic achievement is the overall performance outcome of education that indicates the extent to which a learner has achieved set-out goals. It is an index of measurement that shows a student's cognitive, affective and psychomotor domains in an educational setting (Joe, Kpolovie, Osonwa and Iderima, 2014). More so, Verma (2016) defined academic achievement as a measure of knowledge, understanding or skills in a specific subject or a group of subjects. In vast majority of cases, academic achievement serves as a predictor for career growth, acceptance of change, adaptation to new situations and the development of positive self-esteem and self-confidence (Latrintluangi, 2018).

Despite the contribution of study habits to the academic achievement of students in mathematics, Obiero (2018) observed that poor mathematics achievement has been a global concern despite the actual studies that have been devoted to certain factors which have been identified as possible contributors to mathematics achievement. In similar vein, the state of academic achievement especially among secondary school students in mathematics in Gombe State as observed by the researcher is rather unsatisfactory. The evidences of this perception could be based on the reports of the examination bodies like West African Examination Council (WAEC), NECO among others which indicated the discouraging performance of students in mathematics. The academic achievement of students in mathematics in Gombe State is not only poor generally but continues to fall

over the years. According to Sharma (2015), performance manifests through academic achievement, which is the depiction of a student's study habit.

Study habits embody the techniques that are adopted by a student outside the classroom to make for better understanding of what was taught in a subject over the course of instructional delivery. According to Hassan, Sadaf, Aly and Baig (2018), study habits refer to study practices such as the frequency of studying, sittings, rehearsals of learned materials, review of material, studying in a favourable surroundings and self- testing. It captures the extent to which a student routinely engages in the act of effective reading and note-taking for the purpose of improving their achievement in a subject. Similarly, Bello and Ariyo (2014) asserted that study habit demonstrates the extent to which the student engages in routine acts of effective study for the achievement of high performances in test scores. Study habits entail the practices used by students outside the classroom for an enhanced comprehension of learned materials. Fan and Matsumoto (2014) noted that study habits are of two types namely: good study habits and poor study habits. Fan and Matsumoto added that good habits study focuses on techniques such as preparing study time table, time management, concentration, obtaining and organizing study materials, reading comprehension, note taking among others.

Good study habits focuses on good organization, keeping good notes, reading your textbooks, listening in class, and working every day (Verma, 2016). Additionally, Ogunduyilemi (2018) stated that good study habits embody four indicators namely: the habits of attending lectures, reading books, visiting the library and facing examinations. The general conception is that students who are exposed to good study habits could achieve better than their counterparts who are exposed to bad study habits. In other words, if study habits are thoughtfully applied, they possess the tendency of improving the academic achievement of students in subjects such as mathematics. Instructively, achievement of students in mathematics can be affected by myriad of factors; gender inclusive.

Gender refers to the social role, responsibilities and behaviours believed to belong to men and women. Unfortunately, no consensus has been reached about the effect of gender in science and mathematics achievement. Many research results found in the literature have varying conclusions. For instance, while Cech (2012) and Das and Singhal (2017) found that males perform better than females in Mathematics, Lee and Kung (2018) found that females have higher mathematics achievement than their male counterpart. In contrast, Derrick (2019) and Amatobi and Amatobi (2013) found that no gender difference existed with respect to performance in mathematics as both boys and girls recorded similar performance. From the foregoing, the findings on gender and students' achievement in mathematics are not in agreement hence, its inclusion as a variable to be investigated in this study. More so, there is need to find out if study habits contribute to the academic achievement of students in mathematics; hence the justification for the current study.

Purpose of Study

The purpose of this study was to find out the relationship between secondary school students' study habit and their academic achievement in mathematics in Gombe State. Specifically, the study intends to find out the:

1. Relationship between secondary school students' study habit and their academic achievement in mathematics in Gombe state.
2. Relationship between male students' study habit and their academic achievement in mathematics in Gombe State.
3. Relationship between female students' study habit and their academic achievement in mathematics in Gombe State.

Research Questions

The following research questions guided the study.

1. What is the relationship between the students' study habits and their achievement in mathematics in Gombe State?
2. What is the relationship between the male students' study habits and their achievement in mathematics in Gombe State?
3. What is the relationship between female students' study habits and their achievement in mathematics in Gombe State?

Hypotheses

The study tested the following null hypotheses at 0.05 level of significance.

1. There is no relationship existing between the students' study habits and their academic achievements in mathematics will not be significant.
2. There is no relationship existing between the male students' study habits and their academic achievements in mathematics will not be significant.
3. There is no relationship existing between the female students' study habits and their academic achievements in mathematics will not be significant.

Method

The research design for this study is correlational survey. The study was conducted in Gombe Local Government Area of Gombe State, Northern part of Nigeria. Gombe State was chosen for this study because of the high rate of failure in mathematics by secondary school students in this area irrespective of some positive measures (Extra class lessons, modified classrooms, and qualified mathematics teachers) taken to stop them from mass failure. The population of this study comprised all the 5, 161 (3, 343 males and 1818 females) Senior Secondary two (SS2) students in all the 71 government-owned secondary schools in Gombe North Education Zone as at the time of this study. The sample of the study was made up of 1330 SS 2 students for the 2022/2023 academic session which was made up of 824 males and 506 females. Multi-stage sampling technique was used to select the sample size for the study. First, purposive sampling technique was used to obtain three local government areas out of the five local government areas in the Education Zone as they are the co-educational schools with the highest number of students which will enable the researcher to take care of the gender variables in the study. Proportionate sampling technique was used to obtain 50% of the schools in the local government areas to obtain

18 schools. Then, all the SS II students in the 18 schools were used. The entire exercise gave rise to 824 males and 506 females.

The instrument that was utilized for data collection is questionnaire. The questionnaire is titled Study Habits Inventory (SHI). SHI was adopted from Study Habit Inventory by Bakare (1977). It contains 45 items and divided into eight parts (I-VIII). Part I measures homework and assignments; part II measures time allocation; part III measures reading and note-taking; part IV measures study period procedures; part V measures concentration; part VI measures written work; part VII measures examination and part VIII measures teachers consultation. The instrument was developed in a manner that the respondents will respond by choosing one of five response options viz: Almost Never, Less than Half of the Time, About Half of the Time, More than Half of the Time and Almost Always. No validation was done. This is because the Study Habit Inventory (SHI) is an adopted instrument. For the academic achievement, documents containing results of students in mathematics promotion examination was used for the study. It is an already existing data containing mathematics promotion examination results of students for the academic session under consideration. The reliability of the instrument was established using Cronbach alpha method. The instrument was administered on a representative sample of 40 SS2 mathematics students randomly selected from Government-owned secondary school in Bauchi State which is outside the area of the study. SHI obtained a high reliability coefficient of 0.88 which falls within the acceptable range of at least 0.8 as recommended by Nworgu (2015) of Cronbach alpha coefficient. The data for the study was collected with the aid of 18 research assistants who are mathematics teachers from the schools that was sampled for the study. SHI was administered on that same day using on-the-spot delivery approach. This ensured that the SHI was administered with the corroborative effort of research assistants and retrieved on the spot to ensure recovery of all the drafts of SHI. More so, the researcher ensured that the students were given codes (numbering from 001 to 760) for ease of matching of their responses arising from their study habits and academic achievement. Data arising from the research questions were analyzed using Pearson product moment correlation coefficients. The correlation coefficient was interpreted based on the recommendations of Nworgu (2015). It is thus; Below 0.30 (Low relationship), Above 0.30 (Moderate relationship), Above 0.80 (High relationship). The hypotheses were tested using t-test of correlation at 0.05 alpha level. While taking decisions regarding the hypotheses, a null hypothesis was rejected if the probability value (p-value) is less than or equal to significant value of 0.05; if otherwise ($p > 0.05$), the null hypothesis will not be rejected.

Result

Research Question One

What is the relationship between the students' study habits and their achievement in mathematics in Gombe State?

Table 1: Pearson r on Relationship between Students' Study Habits and their Achievement in Mathematics.

Source of Variation	N	r	Remark
Study Habit Achievement	1330	0.608	High positive Relationship

Data in Table 3 show that there is a high positive relationship existing between students' study habits and their achievement in mathematics. This is evident by the size of Pearson's Correlation Coefficient r , which is 0.608.

Research Question Two

What is the relationship between male students study habits and their achievement in mathematics in Gombe State?

Table 2: Pearson r on Relationship between Male Students' Study Habits and their Achievement in Mathematics.

Source of Variation	N	r	Remark
Study Habit Achievement	824	0.614	High positive Relationship

Data in Table 4 show that there is a high positive relationship existing between male students' study habits and their achievement in mathematics. This is evident by the size of Pearson's Correlation Coefficient r , which is 0.614.

Research Question Three

What is the relationship between female students study habits and their achievement in mathematics in Gombe State?

Table 3: Pearson r on Relationship between Female Students' Study Habits and their Achievement in Mathematics.

Source of Variation	N	r	Remark
Study Habit Achievement	506	0.598	Moderate positive Relationship

Data in Table 5 show that there is a moderate positive relationship existing between female students' study habits and their achievement in mathematics. This is evident by the size of Pearson's Correlation Coefficient r , which is 0.598.

Hypotheses

Hypothesis One

There is no significant relationship between the students study habits and their academic achievement in mathematics.

Table 4: Test of Significance of Pearson Correlation between Students' Study Habits and their Achievement in Mathematics.

Source of Variation	N	r	p-value	Remark
Study Habit Achievement	1330	0.608	0.03	Sig.

Analysis in Table 6 shows that there is a significant relationship between the students' study habits and their achievement in mathematics. The calculated r (0.608) has P -value <0.05 . The null hypothesis one was therefore rejected.

Hypothesis Two

There is no significant relationship between the male students' study habits and their academic achievement in mathematics.

Table 5: Test of Significance of Pearson Correlation between Male Students' Study Habits and their Achievement in Mathematics.

Source of Variation	N	r	p-value	Remark
Study Habit Achievement	824	0.614	0.00	Sig.

Analysis in Table 7 shows that there is a significant relationship between male students' study habits and their achievement in mathematics. The calculated r (0.614) has P -value <0.05 . The null hypothesis two was therefore rejected.

Hypotheses Three

There is no significant relationship between the female students' study habits and their academic achievement in mathematics.

Table 6: Test of Significance of Pearson Correlation between Female Students' Study Habits and their Achievement in Mathematics.

Source of Variation	N	r	p-value	Remark
Study Habit Achievement	506	0.598	0.01	Sig.

Analysis in Table 8 shows that there is a significant relationship between female students' study habits and their achievement in mathematics. The calculated r (0.598) has P -value <0.05 . The null hypothesis three was therefore rejected.

Discussion

The findings of the study revealed that a high positive relationship existed between students' study habits and their achievement in mathematics. This could be attributed to the fact that study habits as a consequence test preparation, lowers the test anxiety level of students in testing situations. Unarguably, any student with low test anxiety level is bound to exude self-efficacy which invariably results in high academic achievement. Corroborating the findings of the current study, Villa and Sebastian (2021) found that study habit is a strong predictor of students' mathematics achievement. More so, Prasetyo, Ridlo and Kartijono (2019) found that a positive relationship existed between the study habits of students and their achievement in biology. Thus, the more studious a student is, the greater the tendency to excel in school subjects.

The findings of the study further revealed that a significant relationship existed between the students' study habits and their achievement in mathematics. In other words, study habit is a significant contributing factor to improved academic achievement of secondary school students in mathematics. Consistent with the findings of the current study

are the findings of Sakirudeen and Sani (2017) that there was significance relationship between note taking, students` use of library, time allocation for study and students` academic performance in Mathematics. The findings of the current study further agree with those of Odiri (2015) that there was significant relationship between students` study habits and Mathematics performance.

Also, from the findings of this study it was revealed that while high positive relationship existed between male students` study habits and their achievement in mathematics, a moderately positive relationship existed between female students` study habits and their achievement in mathematics. This could be linked to the fact that males are more mathematically-inclined than their female counterparts. Supporting this position, Kans and Claesson (2022) posited that male students showed interest in subjects that are precise, logical, and scientific, while the female students emphasized the analytical and challenging aspects to the extent that the subjects forced them to think. Thus, males have more favourable disposition towards Mathematics than their female counterparts. This favourable disposition could be linked to the fact that males appear more motivated to study mathematics than the females. Much as there is paucity of related studies in literature that focused on gender and variables of study habits and academic achievement in Mathematics, Allahnana et al. (2018) found that male students excel in mathematics achievement more than their female counterparts. This lends credence to the fact male students have interest in mathematics than female

This study also indicated that across gender lines, a significant relationship existed between secondary school students` study habits and their academic achievement in Mathematics. The deduction here is that gender is a contributing factor to secondary school students` study habits and their achievement in Mathematics. The findings of the present study are consistent with the position of Olutola and Dosunmu (2016) that there was significant difference between gender and students` science achievement and there was significant relationship between students` study habit and science achievement.

Conclusion

Based on the findings of the study, it was concluded that high positive relationship existed between students` study habits and their achievement in mathematics. Finally, the study concluded that gender moderated the relationship between students` study habits and their achievement in mathematics.

Recommendations

In view of the findings of the study, several recommendations were made which include:

1. Mathematics teachers should evolve teaching strategies that will sustain students` study habits in order to enhance their academic achievement in Mathematics.
2. Parents should make deliberate efforts towards the enhancement of their wards` study habits. This is with a view to improving their academic achievement in Mathematics.

3. Female mathematics students should prioritize the use of effective study habits so as to bridge the achievement gap between them and their male counterparts in Mathematics.
4. Curriculum planners should make conscious efforts towards make revisions in the curriculum contents to encapsulate study habits with a view to enhancing students' achievement in Mathematics.

REFERENCES

- Allahnana, K., M., Akande, M. T., Vintseh, I. M. U., Alaku, E. A. and Monica, E. A. (2018). Assessment of gender and interest in mathematics achievement in Keffi Local Government Area of Nasarawa State, Nigeria. *International Journal of Operational Research in Management, Social Science and Education*, 4 (1), 127-140.
- Amatobi, V.E. and Amatobi, D. A. (2013). The influences of gender and attitude differences to students' achievement in mathematics in Nigerian secondary schools: a case study of Comprehensive secondary school Amurie-Omanze in South Eastern Nigeria. *American Journal of Research Communication*, 1 (1).
- Bakare, C.G.M. (1977). *Study habits inventory*. Ibadan: Psycho.
- Bello, T.O. and Ariyo, B.D. (2014). Secondary school mathematics as determinant of academic performance in university introductory Physics. *Journal of Education and Practice*, 5(39), 102-107.
- Cech, E.A. (2012). The role of high school performance in explaining women's rising college enrollment. *The Sociological Quarterly*, 46 (2), 299-321.
- Das, U. and Singhal, K. (2017). *Gender differences in mathematics performance: Evidence from rural India*. New Delhi, India: IARIW-ICIER Conference.
- Fan, C. and Matsumotto, A. (2014). *The importance of good study habits*. Retrieved from www.answer.com. 12/3/2018.
- Hassan, U., Sadaf, S., Aly, S.M. and Baig, L. (2018). Study habits: Comparison of scores and study habits of first year MBBS students coming from local system vs general education system. *Professional Medical Journal*, 25(3), 466-472.
- Joe, A. I., Kpolovie, P. J., Osonwa, K. E. and Iderima, C. E. (2014). *Modes of admission and academic performance in Nigerian universities*. Retrieved from <http://meritresearchjournals.org/er/content/2014/September/Kpolovie%20et%20a%20l.pdf>.
- Kans, M. and Claesson, L. (2022). Gender-related differences for subject interest and academic emotions for STEM Subjects among Swedish upper secondary school students. *Educ. Sci.*, 12(1), 553. Retrieved from <https://doi.org/10.3390/educsci12080553>.
- Laltrinttuangi, A. (2018). Study habits and academic achievement of undergraduate students in Aizawl city. *105R Journal of Humanities and Social Science (10SR – JHSS)*, 23 (7), 9, 1-5.

- Lee, C.Y. and Kung, H.Y. (2018). Mathematics self-concept and mathematics achievement: Examining gender variation and reciprocal relations among junior secondary school students in Taiwan. *EURASIA Journal of Mathematics, Science and Technology Education*, 14 (4), 1239-1252.
- Melvina, A.N. and Nanjwan, J.D. (2019). Academic locus of control, study habits and secondary school students' academic achievement in mathematics. *International Journal of Research and Scientific Innovation (IJRSI)*, 6 (11), 19-23.
- Muraina, M.B., Nyorere, I.O., Eman, I.E. and Muraina, K.O. (2014). Impact of note taking and study habit on academic performance among selected secondary school students in Ibadan, Oyo State, Nigeria. *International Journal of Education and Research*, 2 (6), 437-448.
- Nworgu, B. G. (2015), *Educational research: Basic issues and methodology*. Ibadan: wisdom Publisher Limited.
- Ogunduyilemi, K. S. (2018). The relationship of undergraduate study habits with use of library resources in two universities in Oyo State, Nigeria. *Library Philosophy and Practice*, 4(1), 1–28. Retrieved from <https://digitalcommons.unl.edu/libphilprac/1862/>
- Obiero, J. (2017). The relationship between achievement motivation and mathematic performance amongst female learners and in selected urban girls' secondary schools in Kenya. *Global Journal of Social Sciences Studies*, 4(1), 23 29. <https://doi.org/10.20448/807.4.1.23.29>.
- Odori, O. E. (2015). Relationship of study habits with mathematics achievement. *Journal of Education and Practice*, 6(10), 168-170.
- Olutola, A.T. and Dosunmu, S.A. (2016). Assessing the impact of study habit and gender on science achievement of secondary school students in Katsina State, Nigeria. *Journal of Science, Technology, Mathematics and Education (JOSTMED)*, 11(3), 202-209.
- Prasetyo, E., Ridlo, S. and Kartijono, N.E. (2019). Relationship between study habits and academic achievement of students at Biology Department-Mathematic and Natural Science Faculty, Universitas Negeri Semarang. *JPBI (Jurnal Pendidikan Biologi Indonesia)*, 5 (2), 297-304.
- Sakirudeen, A.O. and Sanni, B.K. (2017). Study habits and academic performance of secondary school students in mathematic: a case study of selected secondary schools in Uyo Local Education Council. *Research in Pedagogy*, 7 (2), 283-297.
- Sharma, R. (2015). Computer assisted learning – A study. *International Journal of Advanced Research in Education and Technology*, 2 (1), 45-57.
- Ukeje, B.O. (2012). *Foundations of education*. Benin City: Ethiope Pub.
- Verma, A. (2016). A study of academic achievement among high school students in relation to their study habits. *International Journal of Research in Humanities, Arts and Literature*, 4(3), 75-88.