

Relationship between Parental Variables and Students' Academic Achievement in Biology among Secondary Schools in Agaie Local Government, Niger State, Nigeria

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Abstract

Conducive teaching and learning environment are sine qua non for the students' academic achievement in Science and Technology. Nigeria is one the developing countries facing economic turbulences and persistent poverty that engulfed the quality of living standards over the time. There are limited studies on relationship between parents' variables (parents' economic status, type of occupation) and students' academic achievement especially in Niger State. The researchers conducted a study on relationship between parental income, occupation and students' academic achievement in Biology among secondary schools in Agaie Local Government, Niger State, Nigeria. The study adopted correlational design and 811 SSII students participated. The sample was 264 (141 males, 123 females) randomly selected from the population. The data was generated using a questionnaire and scores derived from Biology terminal examination across the schools. The questionnaire was validated and was found to be reliable with Cronbach Alpha coefficient of .81. Data was analyzed using Point Biserial Correlation statistic with hypotheses tested at 0.5 level of significance. The findings revealed that there was significant positive relationship between students' parental income, and their academic achievement in Biology ($r_{pb} [264] = .504, p < 0.05$). The findings also indicated that there was insignificant negative relationship between students' parental type of occupation and their academic achievement in Biology ($r_{pb} [264] = -.011, p > 0.05$). The authors recommended among others that parents should explore more means of income generation as to enhance student's academic achievement in secondary schools in Agaie Local Government of Niger State, Nigeria.

Keywords: Socio-Economic Status, parental income, parental occupation, academic achievement, Biology

Introduction

Scientific and technological developments experienced in the contemporary societies could never be realized in the absence of quality education. It is apparent that all recorded developments could not have been a mere mirage in all developed and developing worlds. Education is not limited to the acquisition of knowledge and skills, but also inculcates values, training of instincts, fostering right attitude and habits. It is a process of cultural transmission from generation to generation or any process by which an individual gain knowledge, insight and develops attitude and skills (Li and Qiu, 2018).

Parental Socio-Economic Status (SES) is composite construct that has been playing a vital role as per as students' academic achievement, child mortality, mental health, physical health and by extension, developmental outcomes across the globe (Viner, *et al.*,2024). Socio-economic status as a combined measure of an individual's or family's economic and social position in relation to others based on income, educational qualification and occupation. It can be seen as a construct that incorporates educational attainment, occupation and income of parents in a given society (Garcia *et al*, 2023). SES is viewed as fundamental cause and driving force behind access to resources, environment and psychosocial stress with a long-lasting effect among various populations. In the modern world, there is social placement otherwise known as “social stratifications”, which entails the division of people into different social classes (Brown *et al.*, 2016). In Nigeria system of social classes, some groups of parents belong to the upper, middle and the lower classes. These groups are divided according to various factors which also include their respective educational level (educational qualification), wealth, income, language, and style of life among others. The upper-class people are those who occupy the most prestigious positions, the middle class are between the upper class and lower class in terms of social status. The lower- or working-class people are those whose income and occupational status are very low in the society (Brown *et al.*, 2016).

Over the years, studies have been conducted on the influence of parents' socio-economic status on academic performance with many results revealing relationship between the two variables (Brown *et al.*, 2016 and Pant, 2020). It was discovered that young learners emerging from lower class families are

susceptible to more developmental delays and learning disabilities than those from a higher economic status (Pant, 2020). The facts remain that parents may not be able to cater for children satisfactorily. Having low economic status can result to children facing difficulties in securing learning materials such as textbooks, exercise books, writing materials and the likes, in some cases difficulty in the transportation to schools, insufficient and balanced diet feeding which effects could lead to several challenges that can harm effective learning. These challenges could be absent among kids from the well to do families in every given community. This is because Parents of high and medium socio classes have controlled over the economic resources and educational material, whereas low socio-economic has control of sustenance to some extent (Pant, 2020).

Empirical evidences have exposed parental SES to have impacts on students' academic achievement in biology. For example, Harris and Harvey, (2024) studied the relationship between parental SES and student's performance in an introductory Biology at first year university level. Their findings revealed that first generation university and lower income family students performed lower compared to students from high SES family. It was also reported by Organization of Economic Co-operation and Development (OECD, 2023), that parental SES is a strong determinant of students' performances in science literacy. Much need to be uprooted on the links between the SES and students' performance especially in places like Niger state where the empirical evidence is not well grounded.

Statement of the Problem

Parents' socio-economic status has been a subject of research across nations for decades with an inconsistent result. There are thousands of learners who scaled through education from a lower-class parent as it is with those. Despite the fact that parents of low economic status may not be able to support the children adequately as could be found in higher class parents, resulting to having inadequate or lacking of necessary learning facilities that could boost performance. many studies discovered relationship between students' performance and parents' economic status (Brown *et al.*, 2016 and Pant, 2020, OECD, 2023; Harris and Harvey, 2024). But some studies still revealed no relationship between the two variables. To the best knowledge of the authors, studies of this nature is very limited in the research location which necessitated this study. This is so because there could be variation or cultural

difference that can have effects on the findings. Hence the need to determine the relationship between parents' income and students' academic achievement in Biology among secondary schools in Agaie, Niger State of Nigeria.

Objectives of the Study

The aim of the study was to determine the relationship between parental variables and students' academic achievement in Biology among senior secondary school students in Agaie Emirate, Niger state. The study sought to achieve the following objectives:

- i. determining the relationship between parents' economic status and students' academic achievement among senior secondary school students in Agaie Emirate
- ii. determining the relationship between parents' type of occupation and students' academic achievement in Biology among senior secondary school students in Agaie Emirate

Research Questions

The following research questions were developed to guide the study:

- i. What is the relationship between parents' income and students' academic achievement in Biology among senior secondary school in Agaie Emirate
- ii. What is the relationship between parents' occupation and students' performance in Biology among senior secondary school in Agaie Emirate

Research Hypothesis

The following null hypotheses were raised to answer the research questions and were tested at 0.05 level of significance:

H₀₁: There is no significant relationship between parents' economic status and students' achievement in Biology among senior secondary school in Agaie Emirate

H₀₂: There is no significant relationship between parental occupation and students achievement in Biology in senior secondary school in Agaie Emirate

Methodology

The researchers adopted correlational research design for this study. The design allows correlating variables to observe the presence, absence of and pattern of relationships. In this study, parents' economic status and type of occupation were correlated with students' academic achievement in Biology to determine the relationship and its patterns.

The population of the study comprised 2,551 (two thousand, five hundred and fifty-one) senior secondary school students (Male = 1327 and Female = 1224) in Agaie Emirate of Niger State, Nigeria during the 2022/2023 academic session (Niger State Ministry of Education, 2023). The target population were eight hundred and eleven (811) biology students (Male = 457 and Female = 354)

The sample of the study were 260 senior secondary II Biology students derived from the 6 randomly selected senior secondary schools in Agaie Emirate of Niger State. Stratified sampling technique was adopted the selection of two schools each from the geopolitical zones of the emirate, two secondary schools were randomly selected, from each school, 44 SSII students were also randomly selected which gave the total sample size of 260 as determined by the Research Advisor's guidelines using the population range of 811, at 5% margin of error.

The instrument, titled 'Juvenile Delinquent Attitude Questionnaire (JDAQ)' was used. The JDAQ is made up of three sections (Sections A, B & C). Section A had students' demographic data, while Section B and C comprised of items on parental socio-economic status and juvenile delinquency of students. The items in the JDAQ will be treated on a five-point Likert type scale and will be rated as follows: Strongly Agree (SA) - 5 points, Agree (A) - 4 points, Neutral (N) - 3 points, Disagree (D) - 2 points and Strongly Disagree (SD) - 1 point. The decision mean will be 3.00. ($5 + 4 + 3 + 2 + 1 = 15/5 = 3.00$).

The instrument was validated by two experts in the field of Biology education and Test and Measurement from the Department of Science Education, Federal University of Technology Minna. All the validators confirmed the

validity of the instrument. A pilot test was conducted at Government Day Secondary School, Nami which is one of the schools in the Emirate but not used for the study. This was conducted using twenty (20) SS II biology students in order to establish its reliability as well as the internal consistency index of the instrument. Data collected was analyzed using Cronbach Alpha formula. A reliability coefficient of 0.81 was obtained indicating that the instrument was consistent and reliable. The instrument was eventually administered to the participants taking into consideration all ethical measures which lasted for four weeks. Data coded were analyzed using descriptive statistics (mean and standard deviation) and Point Biserial statistics.

Results

Table 1: Gender Distribution of the Sample

Students	Frequency	Percent(%)
Male	141	53.4
Female	123	46.6
Total	264	100

Table 1 contains the description of participants of the study based on their gender. The sample comprised 141 male students (53.4%) who participated in the study. There were also 123 (46.6 %) female students who actively participated throughout the study. The total number of sample was 264 (100%) that partook in the study.

Table 2: Parents' Monthly Income of the Students in Agaie Emirate

Parental Monthly Income	Frequency	Percent (%)
Low Income	217	82.2
High Income	47	17.8
Total	264	100

Table 2 displays parents' income status of the students in secondary schools in Agaie Emirate, Niger state. From the table, about 217 (82.2%) have parents with low monthly income, while only 47(17.8%) of the students have parents with high monthly income. This gave the total of 264(100%) which is the exact number of the participants of the study.

Table 3: Parents' Type of Occupation of Secondary School Students in Agaie Emirate

Parental Occupation	Frequency	Percent(%)
Civil Servants	116	43.9
Business Persons	148	56.1
Total	264	100

Table 3 explains the parents' types of occupation of the students in secondary schools in Agaie Emirate, Niger State. From the table, there are 116(43.9%) students whose parents are civil servants in the emirate. The other group are 148(56.1) parents that are business persons, ranging from farming, trading and other businesses.

3. Testing Null Hypothesis

H₀₁: There is no significant relationship between parental' economic status and students' achievement in Biology among senior secondary school in Agaie Emirate

Point Biserial correlation was adopted to determine for significant relationship between parental income and students' performance in Biology as shown in table 4.

Table 4: Point Biserial Correlation of Parental Income and Students' Performance

Variables	N	Mean	Std. Deviation	r_{pb}	P-value	Remark
1.Performance	264	55.40	19.653	.504	.000	Significant
2.Parental Income	264	1.18	.383			

Table 4 reports point biserial results of the link between parents' monthly income and students' performance in Biology in secondary schools in Agaie Emirate. From the results displayed, $r_{pb}(264) = .504$, $p < 0.05$. This implies that there was significant correlation between the two variables. Hence the null hypothesis is rejected, as there was significant relationship between parents' monthly income and students' performance in Biology in secondary schools in Agaie Emirate.

H₀₂: There is no significant relationship between parental occupation and students achievement in Biology in senior secondary school in Agaie Emirate

Point Biserial correlation was adopted to test for significant relationship between parental occupation and students' performance in Biology as shown in table 5.

Table 5: Point Biserial Correlation of Parental Occupation and Students' Performance

Variables	N	Mean	Std. Deviation	r_{pb}	P-value	Remark
Academic Achievement	264	55.40	19.653	-.011	.863	Not Significant
Parental Occupation	264	1.56	.497			

Table 5 describes point biserial results of the relationship between parents' occupation and students' academic achievement in Biology in secondary schools in Agaie Emirate. The results displayed, $r_{pb}(264) = -.011$, $p > 0.05$. This indicates that there was a negative insignificant correlation between the two variables. Hence the null hypothesis is accepted, as there was no significant relationship between parents' occupation and students' performance in Biology in secondary schools in Agaie Emirate.

Discussion

It was evident from the findings of this research that there was strong positive association between the parent's income and students' performance in Biology in secondary schools in Agaie Emirate. The study corroborates the findings of Tahir *et al.* (2021) who conducted a study on the effect of parents' socio-economic status on students' academic achievement in secondary schools. It was discovered from the study that parents' financial status, financial and moral supports influence students' academic achievement in schools.

Moreover, the findings concurred that of Zayyad (2019) who studied the influence of parents' socio-economic status on students' academic achievement in economics in senior secondary schools in Akko Local Government Area of Gombe state. The results multidimensionally revealed that instructional materials like textbooks and writing materials in the most of the schools in Akko Local Government Area were insufficient as a result of poor economic status of the parents of the students which affected their performance. In the same route, the study was also anchored by the findings of Akachukwu *et al.* (2018) in an assessment of the influence of parents' socio-economic status on the academic achievement in Biology of public senior

secondary school students in Orlu, Imo State. The study also revealed that annual income of parents highly correlated with students' academic achievement in Biology. In addition to the previous empirical studies, Kiboi (2018) supported the finding of the study in another study on the effect of selected parental socio-economic status on academic performance of students in secondary schools in Kenya. The results of the study revealed that parents' level of income had effect on the student academic performance. On the other angle, a contrary finding was reported by Gobena (2018) who studied the effect of family socio-economic status on students' academic achievement and the results indicated that family income had no relationship with students' academic achievement. The findings also were in support of Joseph (2016) who investigated the relationships among parents' educational level, income, academic adjustment and performance of senior secondary school students in Kaduna and revealed that significant positive relationship exists between Parental level of income and academic performance of senior secondary school students,

The findings of this study also discovered that there was no significant relationship between parental occupation and students' performance in Biology. This is parallel to the findings of Kiboi (2018) on the effect of selected parental Socio-Economic Status on academic performance of students in secondary schools in Cheptais, Kenya. The findings indicated that the level of parental occupation had effect on students' academic performance. But it is important to note that studies contrary to the findings of this study are limited as a result of the potentiality of parental SES in life.

Conclusion

The researchers thus, made the following conclusions:

- i. Parents' economic status(income) is a significant determinant of, or has relationship with students' performance in Biology at secondary school level.
- ii. Also, parents' type of occupation has no influence on students' academic achievement in Biology at secondary school level. More important is the income earned from an occupation, not the occupation itself.

Recommendations

From the findings of this study, the researchers recommended the following:

- i. Parents should diversify means of generating income as to be able to finance their children in schools for better education
- ii. Parents should go for every legal occupation that can earn money for livelihood
- iii. Teachers and school managements should be abreast of the influence of parents' variables such as economic status as be guided on teaching and other decision taking on students in schools

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