EFFECT OF SOCIO-ECONOMIC BACKGROUND ON SECONDARY SCHOOL STUDENTS' ACADEMIC ACHIEVEMENTS IN MATHEMATICS

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Abstract
The study examined the effect of socio-economic background on students' academic achievement in mathematics. The study adopted a simple opinion survey research design. The population comprises all the students (both public and private) in secondary schools in Ika South Local Government Area. Stratified random sampling scheme was used to select a sample size of 100 students from the population. Questionnaire was used as the instrument for data collection and the data collected were analyzed using simple percentage and chi-square (χ^2) statistical methods. The study revealed among other things that financial/economic status of a family has a significant relationship with student's academic performance in mathematics. Also that family size of a student has significant influence on his/her performance in mathematics. The study equally revealed that the educational status of a family affects the level of achievement of a child. The study then concludes that parental economic status, students' family size, educational status of the parents, parents' marital status among others are some of the socio-economic factors that affect the student's performance in mathematics. The study recommends among other things that the Government should provide education facilities and scholarship for those students from the lower economics status in the society, the Government should increase the rate of education/enlightenment campaign on family planning and child spacing to help reduce child birth to the number parents can take good care of.

Keywords: *Socio-economic background, Achievement, Mathematics, Educational status, Marital status and family size.*

Introduction

Mathematics is a compulsory subject at primary and secondary school levels of education in Nigeria. This is due to its usefulness in almost all spheres of life. It is a pre-requisite for science and technology base courses of study. Even in social sciences. It is also useful for economic life of individual. Any nation wishing to grow economically and technologically must ensure that her citizenry are vast in mathematics. According to Ale (2000), Science and technology has become the basic tools for the development of modern society and a measure of the level of development and mathematics remained the bedrock on which scientific and technological development can be built. In spite of the laudable roles Mathematics has played in the national development of Nigeria, students' achievement has not been encouraging. This reflects consistently in low achievement levels in mathematics among students at the secondary school level. Results from Junior secondary III (JS3), Senior secondary certificate Examinations (SSCE), Mathematics both WAEC and NECO are instances of poor mathematics achievement in the country (Gomoha, 2015). For many years the failure rate in mathematics has been dramatically high in our schools. This does not spell well for a nation like ours that is striving to

grow economically and technologically. Several reasons have been advanced for poor achievement in mathematics by secondary school students. Several researches revealed among others that students performed poorly due to inadequate preparation, inadequate qualified teachers, inadequate instructional materials, poorly equipped mathematics laboratories and libraries, population explosion in classrooms/schools , forcing students to offer mathematics as a subject which he/she lack the aptitude, pre-requisite and competency, poor self concepts, poor societal perception of mathematics and poor parental socio-economical background (Ehiwario & Aghamie, 2016, Madu, 2010 & Adeniran, 2008). Madu (2010) blamed parents for not providing conducive atmosphere for their wards at home as most of them prefer spending money on frivolous things like organizing parties rather than paying their wards' school fees and buying their books.

It is true that children come from diverse homes and are influenced either positively or negatively by certain attributes of their home backgrounds. Therefore, the child brings some of these attributes to bear in the school. Valdez (2009) noted that many educators have focused more on effective instruction in the teaching and learning of mathematics without paying much attention to the idea of home support for education. Valdez, opined that cultural values and family engagement play vital role in the learning process. Douglas (2013) stated that the freedom felt in a familiar, non-threatening environment of one's home encourages mathematical exploration than in a formal school setting which may be intimidating.

Furthermore, parents' engagement in their children's learning at home strengthen` children's interest, intellectual growth and enhance their achievement. Parental involvement in the child's educational according to Adb-El-Fattah (2006) is a mechanism for raising standards. He further maintained that parents' behavior at home is capable of helping to improve the children's overall learning experience. These include helping with the child mathematics homework, buying mathematics textbooks and attending, parent-teachers association meetings and visiting the schools especially on open days to have first hand information about the child's performance in mathematics.

Ezemi (1991) believed that the child's first school is the home. According to him, the home environment of the child provides him with the first opportunity to learn. Ezemi further stressed that the home could be a motivational or inhabiting factor for educational achievement and performance due to the facilities found around the home. Bloom (2005) points out that the child's home is an environmental condition for the formation of cognitive abilities.

Howley & Maynard, (2006) have established linkage between parents' involvement in children's education and higher academic achievement of those children. Vorlis (2003) reported that the children achieved at higher levels in school work when parents offered assistance in mathematics home work. However, poverty limits parents' ability to provide for their children's educational resources at home. For a student to perform well in mathematics, he/she needs financial supports from the parents at least, to be able to provide essential materials but when such parent are not able to make provision for these materials, it would certainly affect the student's achievement.

Statement of Problem

Every child is born into a family setting where he/she spends most of his/her formative years. During this period, he is exposed to so many experiences that are the product of the existing interpersonal relationship and social interaction in the family. Such experiences go a long way to determine the early days and subsequent years of the child in school. But sad enough, most

homes have failed in living up to their responsibility to the children mostly in the area of provision for the academic needs of the child to excel in mathematics.

Purpose of the Study

The general purpose of this study is to examine the effects of socio-economic background on students' achievement in mathematics in secondary schools. While the particular purpose is to ascertain:

i. the effect of parental occupation on students' achievement in mathematics.
ii. how family size affects students' achievement in mathematics.
iii. the effect of parental educational status on students' achievement in mathematics.

Research Hypotheses

The following hypotheses were formulated, to guide the study:

H_{01}**:** There is no significant effect of parents' occupations on students' achievement in mathematics.

H_{02}: There is no significance effect of student's family size on his achievement in mathematics.

H_{03}: There is no significance effect of parental educational status on students' achievement in mathematics.

Literature Review

The Effect of Economic Status of Parent on Students' Achievement in Mathematics

The socio- economic status of parent is one of the bases in which the educational achievement of the student may be influenced. According to Onwegbu (2001) children from high socio-economic homes may be exposed to materials like radios, televisions, videos, Newspapers, books etc which encourage children to learn such items and materials which may not be present in low socio- economic home, so the children in such homes are deprived of them. Children from high socio-economic background are provided with financial support and school materials like textbooks. On the other hand children from deprived social background lack behind in most aspect of school learning as their parents find it difficult to provide financial and material aids for their education.

According to Ezemi (1991), children from poor-economic background could be sent out from school on account of one thing or the other, either for not having notebook or textbook, or for not paying school fees. This not only affects the training of such children but also psychologically. This in turn has adverse effects on their academic achievement.

Effect of Parents' Occupation on Students' Achievement in Mathematics

Related to parental financial status is the occupational status and both having direct influence on the student's training and achievement in mathematics. Ireyefoju (2011), opined that the socio-economic status of the family is partly a function of how parents earned their living: one of the indices of measuring socio-economic status is occupation of parents. According to Ireyefoju, the higher the socio-economic status of the family, the higher the academic achievement of the children, because the child is exposed to academic opportunities earlier in their formative years and provision is made for the child's educational needs. But children from low socio-economic backgrounds are exposed to poor educational opportunities because of the unavailability of funds, even though the family has value for education.

Effect of Family Size on Students' Achievement in Mathematics

According to Ireyefoju (2011), in a large family where members depend, relatively on small income or resources, the school age children are confronted with a lot of problems or challenges which include available space to study, hunger and lack of concentration, the tendency to drop-out of school, the first sibling assisting the parents to send the younger ones to school instead of the parents, and the parents not giving considerable attention to the children. According to the researcher, the result of all these is that children from such homes are already disadvantaged and ill-equipped for the task of learning particularly in the school setting.

Okobia, (1991) stressed that, the greater the home size, the more difficult it is for parents to cater for their children educationally. By implication, children in such home cannot performance well in mathematics. Harrison (1999) noted that there exist a significant inverse relationship between a child's family size and his level of achievement in school. The children from large families may face negligence from parents because of the number of children.

Effects of Educational Qualification of Parents on Students' Achievement in Mathematics

The educational qualification of parents is a vital element of socio-economic factor that affects student's training and academic achievement in mathematics. According to Ireyefoju (2011), literate and educated parents encourage their children by exposing them to educational materials, even before school age. It is sometimes noticed that some non school age children and school age children, who are yet to read and write, are desirous to read and write, because they see their parents and older ones in the home engaged in reading and writing. Douglas (2013) maintained that lack of adequate stimulation in the early year of a child may not only affect the child adversely at that time but also may prevent him from benefiting fully from what the school has to offer him as he reached the age of entering into the educational system. Similarly, Daniel (2007) stressed that in a home where the parents are well educated, the students' education is valued. And as such parents do everything to provide educational facilities at home. He went further to say that well educated parents will wish their children to benefit as they have done from their good education and will provide necessary cash in order that this may be accomplished. Daniel added that children from elite families discuss freely with their parents, this social relationship would enhance good performance in the child's educational pursuit.

Omozeghian (2003) pointed out that the children from literate homes usually perform better than those from illiterate homes, the reason being that those from elite homes have time and value for their children education Fontana (2000), pointed out that Educational facilities at home do help to influence the child's performance positively. According to him, Educational materials, such as mathematics textbooks, toys and other relevant mathematical instruments at home stimulate the child's academic achievement and interest.

Ugbo (2014) noted that parents' level of education has direct and positive link with their children's training and achievement in mathematics. According to him, a student whose parents are good in mathematics and sciences is bound to be good in same field. This may be due to the encouragement being received from home.

Research design

A simple opinion survey research design was used for the study. This research design was adopted to stimulate relevant responses. It was a design that sees information on the item of the population without manipulation of any variable.

Population of the study
The population of the study consists of all the secondary school students in Ika South Local Government of Delta State.

Sample and sampling techniques
The sample size of 100 students was drawn from the population using multiple stage stratified random sampling technique. Here the schools in the study area were sub-divided into two strata, namely: public secondary schools and private secondary schools. Thereafter, a simple random sampling technique was adopted on each of the stratum to select five schools from private and public schools. Finally, 20 students each were randomly selected from the five schools.

Research Instrument
The instrument used for the study was basically questionnaire. It was made up of 26 test items structured in line with the statement of the problem, purpose of the study, research questions and hypotheses. Questions were constructed in such a way that elicits responses from the respondents. The instrument was sub-divided into two sections, A and B. Section A, obtains information on personal data while Section B, has twenty-six (26) items. A four point likert scale response of strongly agreed (SA), Agreed (A), Disagreed (D) and Strongly Disagreed (SA) were used to ascertain the degree of acceptance of the items in the questionnaire.

Validity of Research Instrument
In order to ensure the validity of the research instruments two experts in mathematics education subjected the questionnaire to both face and content validation. They were asked to review the questions and where necessary make corrections and suggestions. Thereafter, the corrections made were put into consideration before drafting the copy administered.

Reliability of Instrument
To ensure the reliability of the instrument, a test re-test method was employed on the sample subjects. The pearson product moment correlation coefficient was used to obtain the correlation coefficient. It was observed to be 0.71. This indicates that the instrument was reliable and hence useable.

Administration of Instrument
A total of 100 copies of the questionnaire were administered to the students in the study area. They were required to give their candid responses to the items in the questionnaire, which involved ticking (x) in the appropriate space provided. There were 100% response, as the completed copies were retrieved immediately by the researchers.

Method of Data Analysis
The personal data were analyzed with simple percentage while the hypotheses were tested using chi-square statistical method at 0.05-level of significance.

Decision Rule
The null hypothesis is rejected when the chi-square calculated is greater than the chi- square tabulated (critical values), otherwise it is accepted.

Presentation and Analysis of Data

Table 1: Type of School

S/N	School type	Freq.	%
1	Public schools	60	**60**
2	Private schools	40	**49**
Total		**100**	**100**

Table 1 shows the school type of the respondents. The result of the analysis shows that 60% of the respondents were from public schools while 40% were from private schools.

Table 2: Sex of the Respondents

S/N	Sex	Frequency	(%)
1	Male	55	**55**
2	Female	45	**45**
Total		**100**	**100**

Table 2 shows the sex distribution of the respondents. The result of the analysis shows that 55% are male while 45% are female.

Table 3: Age of Respondents

S/N	Ages in years	Frequency	%
1	11-15	38	**38**
2	16-20	47	**47**
3	21 and above	15	**15**
Total		**100**	**100**

Table 3 shows the age distribution of the respondents. The result of the analysis shows that 38% of the respondents are in the age bracket of 11-15, 47% are in the age bracket of 16-20 while 15% of them are in the age bracket of 17 and above.

Table 4: Number of children of the respondents' parents

S/N	No of children	Frequency	%
1	1-3	15	**15**
2	4-5	30	**30**
3	>5	55	**55**
Total		**100**	**100**

Table 4 shows the distribution of the number of children of the respondents' parents. It reveals that 15% of the parents had between 1-3 children, 30% of them had 4-5 children and 55% of the parents had more than 5 children.

Table 5: Educational Qualification of respondents' parents

Edu. Qualification	Freq.	%
None	10	**10**
Primary six cert.	20	**20**
SSCE	35	**35**
B.Sc/B.A/B.ed	30	**30**
Others	5	**5**
Total	**100**	**100**

Table 5 shows the educational qualification of respondents' parents. It was revealed that 10% of the respondents had no formal education, 20% of them had primary six certificates, while 35% of them possess secondary school certificate. On the other hand, 30% and 5% of the respondents had first degrees and others qualifications respectively.

Test of Hypotheses

In this section, the research hypotheses were tested at 0.05 level of significance using chi-square test statistic. The results are as follows:

H_{01}: There is no significance relationship between financial/economic status of parent and students' achievement in mathematics.

In order to test the above hypothesis, items 1, 2, 3, 4 and 5 of the questionnaire were used.

Table 6: Chi-square distribution on the effect of financial/economic status of parents and students' achievement in mathematics

Observed freq (0)	Expected freq (E)	$(0-E)^2$	$(0-E)^2/E$
32	32.4	0.16	0.005
48	36	144	4
12	20.4	70.56	3.459
8	11.2	10.24	0.914
41	32.4	73.79	2.283
40	36	16	0.444
10	20.4	108.16	5.302
9	11.2	4.84	0.432
27	32.4	29.16	0.9
29	36	49	1.361

30	20.4	92.16	4.518
14	11.2	7.84	0.7
20	32.4	153.76	4.746
31	36	25	0.694
29	20.4	73.96	3.625
20	11.2	77.44	6.914
42	23.4	92.16	2.844
32	36	16	0.444
21	20.4	0.36	0.18
5	11.2	38.44	3.432
Total			**40.42**

$$\chi^{2}_{0.05} = 21.03$$

From table 4.8, we observed that the chi-square calculated is 40.42 while the critical value is 21.03 at 0.05 level of significant. Since the calculated value is greater than the critical value, we then reject the null hypothesis (H_{01}) and conclude that there is a significant relationship between financial/economic status of parents and students' achievement in mathematics.

H_{02}: There is no significant relationship between student's family size and his performance in mathematics.

Items 6, 7, 8, 9 and 10 of the questionnaire were used in testing the hypothesis.

Table 7: Chi-square Distribution on the Effect of Family Sizes and students' Achieve-ment in Mathematics

Observed freq (0)	**Expected Freq (E)**	**$(O-E)^2$**	**$(O-E)^2/E$**
35	39.8	23.04	0.579
45	36.4	73.96	2.032
13	13.4	0.16	0.12
7	10.4	11.56	1.112
37	39.8	7.84	0.197
40	36.4	12.96	0.356
13	13.4	0.16	0.012
10	10.4	0.16	0.015
42	39.8	4.84	0.122
40	36.4	12.96	0.356
10	13.4	11.56	0.863
8	10.4	5.76	0.554
40	.39.8	0.04	0.001
25	36.4	129.96	3.570
20	13.4	43.56	3.251
15	10.4	21.16	2.035
45	39.5	27.04	0.679
32	13.4	345.96	25.818
11	10.4	0.36	0.035
12	39.8	772.84	19.816
Total			**61.42**

$$\chi^{2}_{0.05}(12) = 21.03$$

From table 4.10 we observed that the chi-square calculated is 61. 42 while the chi-square tabulated is 21.03 at 0.05 level of significance. Since the calculated chi square value exceeds the critical value, we then reject the null hypothesis (H_{02}). This implies that there is significant relationship between student's family size and his training and achievement in mathematics. That is to say, family size of a student affects his achievement in mathematics.

H_{03}: There is no significant relationship between educational status of parents and students' performance in mathematics.

In order to test the above hypothesis, items 11, 12, 13, 14 and 15 of the questionnaire were used.

Table 8: Chi-square Distribution on the Effect of Educational Status of Parents and Students' achievement in Mathematics

Observed freq. (0)	**Expected freq. (E)**	**$(0-E)^2$**	**$(0-E)^2/E$**
30	26.6	11.56	0.435
35	24.6	108.16	0.413
20	28.6	73.96	2.586
15	20.2	27.04	1.339
33	26.6	40.96	1.540
25	24.6	0.16	0.007
27	28.6	2.56	0.090
15	20.2	27.04	1.339
20	26.6	43.56	1.638
21	24.6	12.96	0.527
34	28.6	29.16	1.020
25	20.2	23.04	1.141
10	26.6	275.56	10.360
13	24.6	134.56	5.470
40	28.6	129.96	4.544
37	20.2	282.24	13.972
40	26.6	179.56	0.787
22	28.6	43.56	1.523
9	20.2	125.44	6.210
Total			**61.69**

$$\chi^2_{0.05}(12) = 21.03$$

From table 4.12, we observed that the chi-square tabulated is 21.03 at 0.05 level of significant. Since the chi square calculated values exceed the critical values, we then reject the null hypothesis (H_{03}). This implies that there is significant relationship between educational status of parents and students' achievement in mathematics.

Discussion of results

The study shows that there is a significant relationship between financial/economic status of parents and students' achievement in mathematics. This is in line with the finds of Onwegbu (2001), who noted that children from high economic homes background may be exposed to materials like radios, televisions, videos, Newspapers, books, etc. which encourage children to learn such items and materials. These materials may not be present in low economic home. This

gives the children from wealthy home learning advantage over those whose parents are poor. It also agrees with Ezem (1991) who observed that Children from poor socio economic background could be sent out from school for not paying fees or for not having their books. This to a very a large extent affects their performance.

The study also pointed out that there is a significant relationship between a student's achievement in mathematics and his family size. This collaborates the findings of Okobia (1991) and Harrison (1999). In this light Okobia (1991) states that, the greater the size of a home, the more difficult it is for parents to cater for their children educationally and other wise. By implication, it means that family size has an influence on the child's performance in mathematics. Harrison (1999) noted that there exist an inverse relationship between a child's level of performance in school and family size. He stressed that children from large families may face negligence from parents because of the number of children.

It was revealed that there is significant relationship between the educational status of parents and students' achievement in mathematics. This is in line with the findings of Omozeghian (2003), Fontana (2000), and Ugbo (2014). According Omozeghian (2003), children from literate homes usually perform better than those from illiterate homes, the reason being that those from elite homes have time and value for their children education. Fontana (2000) pointed out that Educational facilities at home do help to influence the child's performance positively. According to him, Educational materials, such as mathematics textbooks, toys and other relevant mathematical instruments at home stimulate the child's academic performance and as such they are encouraged. Ugbo (2014) noted that parents' level of education has direct and positive relationship with their children's achievement in mathematics. According to him, a student whose parents are good in mathematics and sciences is bound to be good in same field. This may be due to the encouragement being received from the parents.

Conclusion

Based on the research findings, the study concludes that parental economic status, students' family size, educational status of the parents, parents' marital status among others are some of the socio-economic factors that affect the student's performance in mathematics.

Recommendation

Based on the findings and conclusion of the study, the followings recommendations were made:

i. The Government should create awareness for parents to know the importance of education and mathematics in particular and give it the right priority in the families.
ii. The Government should provide education facilities and scholarship for those students from the lower economics status of the society.
iii. The Government should increase the rate of education/enlightenment campaign on family planning and child spacing to help reduce child birth to the number parents can take care of.
iv. Parents should provide educational facilities at home for their children.

References

Abd El-Fettah, S.M (2006). *The relationship among Egyptian adolescents' perception of the parental involvement, academic achievement and achievement goals.* A meditational analysis. International educational journal 7, pp. 499-509.

Adeniran, S.A (2008). *Societal Perception of Mathematics and its relevance to educational Reforms.* Proceeding of Annual National Conference of Mathematical Association Nigeria.

Ale, S.O (2000). *Under-achievement in school mathematics: Causes and remedies.* A paper presented at the foundation post-graduate course in Mathematics education at the National Mathematical Centre, Abuja.

Bloom A.A (2005): Family factors and students achievement. An avenue to increase students' school psychology quarterly; 178-206.

Daniel, E.B(2007); Elimination of children's fear for education. Lusille House Editorial London.

Douglas S.O (2013). Sociology of Education Longman, Ikeja, Nigeria.

Edmund, H. (2002). The dynamic self-concept: A social psychology perspective. Annual review of psychology, 38, 299-337.

Ehiwario, J.C. (2015). Improving students' Attitude towards the study of Mathematics at the primary school level of Education in Delta state. Journal of Mathematics education, 4(2), 77-93.

Ehiwario, J.C. and Aghamie, S.O. (2016). Gender disparity in secondary school students Achievement in Mathematics in Ika south local Government of Delta state. Contemporary Journal of Empirical Research (CONJER). 2(4), pp. 258-282.

Ezemi, B. (1991). Teaching population and family life education in Nigeria, Benin City education in Nigeria, Benin Cit. All International Printing.

Fontana Z. (2000): Understanding adolescent psychology. Ibadan End Time Publishing House Limited.

Gomoha, H.O (2015). Poor achievement of students in mathematics. *International Journal of Natural Science.*

Harrison, G.A. (1999). Family structure and prevalence of behavioural problems among Nigerian adolescents. *The Counselor,* 17(1) 154-161.

Howkey, A. & Maynards, S. (2006). *Parents and community involvement on rural schools educational resources information center* (ERIC) US Department.

Ireyefoju, P. (2011). Socio-economic background of the school child in Whawo, D.D. edited Sociology of Education. Justice Jeco Printing and Publishing Global, Benin City.

Madu, J.K. (2010). Correlation between Family background and achievement in mathematics in secondary schools Enugu south educational zone. *Journal of Mathematics and Computer science.* 5(7), pp. 456-469.

Mccollins, R. and Russo, K. (2013). Parents involvement in children education. *Journal of Research in Education*, 8 (60. 41-48.

Okobia, D.O. (1991). *Psychology of human learning.* Kribs Publication, Agbor.

Onwegbu, O.C. (2001). Essential of human growth and development. End Time Publishing Ltd, Agbor.

Omozeghia, G.E. (2003). Introduction to sociology of Education. Alcel Concerns.

Valdez, G. (2009). *Family background and achievement in mathematics North Central Eisenhower. Mathematics and screen consortium.*

Van Vorlis, F.L. (2003). Interactive homework in middle school. Effect of family involvement and science achievement. *Journal of Educational Research,* 96, pp. 323-338.