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Influence of Family Background on Academic Achievement of Secondary School Biology Students in Anambra State

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Abstract

The study sought to find out how family background of students in Anambra State, Nigeria influences their academic achievement in senior secondary school Biology. A survey design was adopted for the study. Five hundred and forty-six (546) Senior Secondary Two (SS2) biology students were drawn by simple random sampling from 14 schools within Awka, Nnewi and Onitsha Education Zones, in Anambra State. Three research questions and four hypotheses guided the study. Data were collected using a researcher constructed questionnaire and students' SS1 and SS2 school results. The results revealed that family structure, parents' occupation and educational level of parents, did not have significant influence on students' achievement

in biology. Based on the findings, the paper concludes that family background did not have much influence on students' achievement in science (biology) as against what most previous studies portrayed. Researches should therefore focus on other possible factors that contribute to students' poor performance in Biology and science generally in order to find lasting solution to the problem. Some recommendations were also made.

Key words: Biology, polygamous, monogamous, occupation, educational level, academic achievement.

Introduction

The overall importance of education in general and science education in particular to mankind cannot be over-emphasized. No nation can afford to neglect science education at any level of education and hope to thrive in any field of human endeavour. Science education is imperative for useful living in any society. It is at the centre for producing resources necessary for socio-economic, scientific and technological development needed for advancement of any nation.

The above notwithstanding, much has been said about secondary school students poor performance in science generally and biology in particular. Over the years, performance in biology has been dwindling. For instance, Okoye and Okeke (2007) in their study found that in 2002, 2003 and 2004 the percentages of candidates who passed West African School Certificate Examination (WASCE) at credit level and above (grades 1-6) in biology were 30.3%, 42.1% and 30.2% respectively. Similarly, Egbunonu and Ugbaja reported that only 30.29% of the biology students who sat for the WASCE between 2000 and 2005 passed at credit level above (A1-C6). In 2008, WAEC Chief Examiners reported a decline in performance in biology especially the theoretical aspect (WAEC, 2008). Again, the Nigerian Television Authority (NTA) on March 17th, 2010 reported that National Examination Council (NECO) recorded 74% failure in biology in their Nov/Dec. 2009 SSCE examination result. Statistics from May/June 2007-2012 Senior Secondary Certificate Examination by WAEC shown in Table 1 tell the same story.

The implication of this persistent poor performance of students in biology is that a great percentage of them fail to get grades that will take them to higher institution for higher studies. This has been a source of concern to well-meaning Nigerians, parents, researchers and science educators. Thus,

researchers in science education in Nigeria have continued to seek for ways of improving the situation and maximize meaningful learning of biology by the students.

Biology is described as a science of life and plays a very vital role in the life of every human being. It is very vast with many divisions including zoology, botany, ecology, genetics, morphology, anatomy, physiology, histology, microbiology, biochemistry, evolution and the more advanced cell biology, molecular biology, among others. Apart from the inter-relatedness that exists among these branches, biology is closely related with other science subjects like agricultural science, chemistry, geography, mathematics and physics. Little wonder then that biology finds application in many specialized areas like medicine, pharmacy, food production and processing industries, biotechnology, genetic engineering, agriculture and horticulture, environmental protection, tourism industry (biological gardens) and so on.

Considering biology's many branches and vast applications in every field of human endeavour as enunciated above, its importance in a nation's economic development cannot be over-emphasized. It therefore becomes very necessary that efforts are geared towards finding a lasting solution to students' poor performance in the subject. To this end, several factors have been identified by researchers as being responsible for the persistent poor performance recorded in biology especially at Senior Secondary Certificate Examinations. Some of these include lack of teachers, lack of educational facilities like laboratories, overloaded syllabuses, laziness, poor attitude and lack of interest on the part of the students, poor teaching methods by teachers, large class size/ high teacher : student ratio and family/home background of the students. Despite the fact that many educationists believe that family background has influence on children's performance in school, considering the fact that education starts from the home, not much empirical studies have been carried out in recent times to support this assertion especially in Anambra state (most of the available studies are old). Besides, much of the data available on this topic are theories and opinions of individuals. It is also not certain that such study has been carried out in biology as these researchers could not lay their hands on any. Hence, there is need to carry out this study to obtain an authentic and current information on how family background influences students' performance in Biology.

The family has the potential to influence a child's academic achievement. This is because it is the first environment of the child. The initial experience

that would mould the child's values, aspirations, emotions, interest and attitudes are offered by the parents/family (Okeke, 2009). What the child learns at home and how his family motivates him towards education contributes to the child's success in school (Essien, 2002). Similarly, Obasi (1999) observed that mere making sure that the children are prepared for school in the morning is important for the children's successful achievement at school.

Family background is a collective terminology comprising of social class/status, economic status, family size, family structure, parents' educational level, occupation and other factors pertaining to family life. Family background in the context of this study refers to family structure, parents' occupation and parents' level of education. By family structure is meant whether the family is monogamous or polygamous. Monogamy refers to a system of custom whereby a man or woman is allowed to have only one spouse at a time while polygamy is a system which allows one to have more than one wife, as in Nigeria and many other African countries. Parents' occupation is considered in two levels in this study – civil service and trading which are the dominant occupations of people living in the area of study. With regards to level of education, parents are classified into high level (those with M.Sc, PhD), middle level (those with OND/NCE) and low level (those with FSLC, SSCE). The problem of this study therefore, was to determine the influence of family background on Senior Secondary Two (SS2) students' achievement in biology.

The significance of this study lies on the fact that it will awaken the consciousness of biology teachers to the fact that students come from different family background and therefore have different upbringing. So they will definitely exhibit different characters and behaviors. The outcome of the study will therefore enable the teachers to pay more attention to students' individual differences as they carry out their pedagogical activities in the classroom. This will go a long way to encourage the weak ones to begin to improve.

Purpose of the study

The main purpose of this study was to determine the influence of family background on academic achievement of secondary school biology students in Anambra state. Specifically, the study will determine the influence of:

1. family structure (monogamous and polygamous families) on students academic achievement in biology.
2. occupation of parents on students' academic achievement biology.
3. parents' level of education on students' academic achievement in biology.

Research questions

Three research questions were posed to address the problem of this study.

1. How does the family structure (monogamous/polygamous) influence students' achievement in biology?
2. How does the occupation of parents (civil service/trading) influence students' achievement in biology?
3. How does the parents' level of education (high, middle and low) influence students' achievement in biology?

Research hypotheses

To make decisions on the answers to the research questions, four null hypotheses were tested at 0.05 level of significance.

1. Family structure has no significant influence on the mean achievement scores of students in Biology.
2. Parents' occupation has no significant influence on students' mean achievement scores in Biology.
3. Parents' educational level has no significant influence on students' mean achievement scores in Biology.

Method

Descriptive survey was adopted for the study. The study was carried out in public secondary schools in Anambra state of Nigeria. Anambra State has six education zones, namely: Aguata, Awka, Nnewi, Ogidi, Onitsha and Otuocha. The population of the study consisted of all SS2 biology students in public secondary schools in the six education zones in the state numbering 16,886.

Five hundred and forty-six (546) students constituted the sample for the study. Three education zones, Awka, Nnewi and Onitsha, were randomly sampled from the six education zones. Out of 143 secondary schools in these

three zones, 14 were selected by proportionate random sampling at the ratio of 6:5:3 respectively, that is, 10% of the total number of schools in each zone. In each of the 14 schools, one intact class was randomly sampled and used for the study. The number of schools sampled and the distribution of biology students used for the study is shown in Table 2.

Two instruments were used for data collection – a questionnaire which sought information on the students' family background and the students' annual results in Biology from SS1 to SS2 which was obtained from the school authorities.

Data collected were analyzed using means, t-test, and ANOVA. The null hypotheses were tested at 0.05 level of significance.

Results

Research Question 1: *How does the family structure (monogamous/polygamous) influence students' achievement in biology?*

The mean and standard deviation of the influence of students family structure on students' achievement is shown in Table 3.

The result in this table shows that students from monogamous family had a mean achievement score of 54.56 with standard deviation of 10.41, while students from polygamous families had a mean achievement score of 56.03 with standard deviation of 11.36. Students from polygamous families therefore achieved higher in biology than the students from monogamous families.

Research Question 2: *How does the occupation of parents influence student's achievement in biology?*

The mean and standard deviation of the influence of parents' occupation on students' achievement is shown in Table 4.

The result shows that the mean achievement score of students whose parents are civil servants is 55.48 with SD of 11.48, while the mean achievement score of students whose parents are traders is 54.60 with SD of 9.93. This shows that students whose parents are civil servants achieve higher in biology than those whose parents are traders.

Research Question 3: *How does the parents' level of education influence students' achievement in biology?*

The mean and standard deviation of the influence of parents' level of education on students' achievement in biology is shown in Table 5.

The result in the table shows that students from high, middle and low parental level of education had mean achievement scores of 55.30, 54.97 and 54.77 respectively. This shows slight difference in the mean achievement scores of the students following the same order as level of education of their parents from high to low.

Hypothesis 1: *Family structure (monogamous/polygamous) has no significant influence on the mean achievement scores of students in biology.*

The result of the analysis is shown in Table 6.

From the table, the result showed that the calculated t-value (1.50) was less than the critical t-value (1.96) at 0.05 level of significance. Therefore, the null hypothesis was accepted. This shows that there is no significant influence of family structure on students' achievement in biology.

Hypothesis 2: *Parents' occupation (civil service/trading) has no significant influence on students' mean achievement scores in biology.*

The analysis is shown in Table 7.

The result in this table showed that the calculated t-value (0.95) was less than the critical t-value (1.96) at 0.05 level of significance. The null hypothesis was accepted. This shows that there is no significant influence of parents' occupation on students' achievement in biology.

Hypothesis 3: *Parents' educational level (high, medium and low) has no significant influence on students' mean achievement scores in biology.*

The result of this analysis is shown in Table 8.

The table indicates that the group as main factor is not significant on students' achievement in biology. This is because F-cal (0.11) was less than F-critical (3.00) at 0.05 level of significance. Therefore the null hypothesis was accepted. Hence, there is no significant influence of parents' level of education on students' achievement in biology.

Discussion

The result in Table 3 shows that the mean achievement score of students from polygamous family is higher than that of the monogamous family. This

may be due to the natural tendency for children to interact and gain experience from their older and numerous siblings who often play the role of teachers at home to the advantage of the younger siblings. Also the spirit of competition that may naturally exist among the children in polygamous family could ginger them to hard work especially in academics. This finding however, disagrees with Onyeabo in Nwachukwu (2002) who stated that the larger the family, the poorer the school achievement of their children. However, result from Table 6 shows that there is no significant influence of family structure on students' achievement in biology.

In Table 4, the result shows that the mean achievement score of students whose parents are civil servants is higher than that of the students whose parents are traders. This may be possible because such parents are likely to be more educated than parents who are traders and are therefore expected to know the value of education more than the traders. However, this influence of parents' occupation on students' achievement in biology is not significant (Table 7). The implication of this is that everybody is now aware of the importance of education and in particular science education in this era of science and technology. Even the uneducated traders now invest so much on the education of their children to make sure that the educational opportunity they did not have does not elude their children.

Table 5 shows slight difference in the achievement scores of students belonging to parents with different levels of education. This slight difference may be due to the fact that the highly educated parents belong to the upper and middle classes and are therefore economically buoyant. Consequently, they can afford to provide all necessary textbooks, workbooks and arrange for extra tutorials for their children. In addition, these parents would normally send their children to the 'best' schools where there are well-qualified teachers, well-equipped laboratories and libraries and other necessary things that facilitate success in science subjects (Emejulu, 2006). These things according to Ikechukwu (2009), positively affect students' academic performance. However, the result in Table 8 reveals that this difference is not significant. As said earlier, this may also be due to the fact that parents, whether highly educated or not, have realized the importance of their children acquiring education especially science education. This is quite encouraging. This finding is in line with Essien (2002) who found that parents' level of education had no significant influence on the students' performance in Geography. The result however, is in contrast with Odebunmi (1988) and

Nwachukwu (2002) whose studies showed a significant difference between the academic performance of students and parents educational attainment.

Conclusion

This study reveals that family background including family structure, parental occupation and parental education level had no significant influence on students' achievement in biology. The implication of this is that parents of this age are more aware and serious about giving their children the best education they can irrespective of their own shortcomings. Most studies carried out earlier were showing significant influence of family background on students' achievement. Consequently many researchers indicted parents as contributing to students' poor performance in science, for example Okafor (2010). It is gratifying to note that things are changing for the better as regards family background influence on academic achievement as this study reveals.

Perhaps from the foregoing, researchers should intensify their research efforts towards other possible factors in order to find lasting solution to the problem of poor performance in this very important subject called Biology.

Recommendations

Based on the findings and discussion made above, the researchers recommend as follows:

1. Parents should continue to get involved in their children's academic progress by monitoring their activities in and out of school, ensuring that home work is done, providing all necessary materials they need in school and meeting with their teachers when the need arises.
2. Since the findings of this study seem to suggest that parents, irrespective of their background status, are getting involved in their children's academic work, they should be regularly informed of their children's academic progress by the school authorities.
3. Similar studies could be carried out in other states of the federation with different cultures to ascertain whether the same result will be obtained.

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Table 1: Statistics of Biology results in May/June SSCE (2007-2012)

Year	Total no. of candidates that sat for the exam	Numbers & percentage of different grades		
		Credit (1-6)	Pass (7-8)	Fail (9)
2007	609,026 (92.27)	96,202 (15.79)	142,044 (23.32)	370,800 (60.88)
2008	841,868 (95.46)	36,348 (31.29)	286,909 (34.08)	291,475 (34.62)
2009	1036,520 (97.17)	322,310 (31.39)	365,140 (35.57)	339,070 (33.03)
2010	1203,028 (99.41)	466,115 (38.75)	354,108 (29.43)	319,060 (26.52)
2011	1347,050 (96.34)	492,422 (36.56)	409,584 (30.41)	362,238 (26.89)
2012	5135,283 (97.63)	488,302 (31.81)	478,840 (31.19)	509,849 (33.21)

Source: WAEC Annual Report 2007-2012

Table 2: The distribution of SS II biology students sampled from the three selected education zones

Education Zone	No. of schools	No. sampled	No. of SS II Biology students sampled
Awka Zone	62	6	233
Nnewi Zone	50	5	198
Onitsha Zone	31	3	115
Total	143	14	546

Table 3: Mean and standard deviation of the influence of students' family structure on achievement in biology

Family Structure	N	Mean	SD
Monogamous	365	54.56	10.41
Polygamous	181	56.03	11.36

Table 4: Mean and standard deviations of the influence student's parents' occupation on their achievement in biology

Parents' Occupation	N	Mean	SD
Civil Servant	277	55.48	11.48
Traders	269	54.60	9.93

Table 5: The mean and standard deviation of the influence of parental level of education on students' achievement in biology

Parents' Level of Education	N	Mean	SD
High education (M.Sc/Ph.D)	215	55.30	10.88
Medium (OND/NCE, HND/B.Sc)	202	54.97	11.09
Low (FSLC, SSCE)	129	54.77	10.01

Table 6: t-test comparison of mean achievement in biology of students from monogamous and polygamous families

Family Structure	N	Mean	SD	Df	Cal-t	Critical-t	Sig (2 tailed)
Monogamous	365	54.56	10.41	544	1.50	1.96	0.13
Polygamous	181	56.03	11.36				

P < 0.05

Table 7: t-test comparison of mean achievement in biology of students from parents of different occupations

Parents' Occupation	N	Mean	SD	Df	Cal-t	Critical-t	Sig. (2-tailed)
Civil servants	277	55.48	11.48	544	0.95	1.96	0.34
Traders	269	54.60	9.93				

P<0.05

Table 8: One-Way ANOVA comparison of mean achievement in biology of students from parents with different levels of education

Source	Sum of Squares	Df	Mean Square	f-cal	F-crit	Sig. (P)
Between groups	24.69	2	12.34	0.11	3.00	0.90
Within groups	62875.28	543	115.79			
Total	62899.96	545				

P<0.05