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Socio-Economic Determinants of Academic Performances in Aguata Local Government Area, Anambra State

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Abstract
Education is regarded as the greatest investment that any nation can make for the development of its human and material resources. This paper investigated the socio-economic determinants of academic performance in Aguata local government area, Anambra state. The study made use of a qualitative response regression model to analyze the participant's responses obtained through a well-structured questionnaire. The study presents some interesting findings. The ML-Binary logit estimation results show that parental income (PI); number of hours of study (NHS); parent educational achievement (PEA) and power supply (PS) have positive and significant impact on student's academic performance (AP), family size (FS) has a negative and significant impact on student's academic performance (AP) whereas residential area (RA) has positive and insignificant impact on academic performance. The correlation results show that all the variables except family size are positively correlated with student's academic performance. The study therefore recommends that since parental income is a very important variable which influences student's academic performance; government employment initiatives should be strengthened while those that are not effective should be reviewed. Government's effort to boost power supply should be intensified beyond mere transfer of ownership to the private sector. Epileptic power supply does not augur well with the academic performances of students as the finding of this study has shown.
Key words: Education, Academic performance, Anambra State.
JEL Classification: P17, H4, H7

1. Introduction/background to the study

Education is the best legacy a nation can give to its youth. This would suggest that the development of any nation or community depends largely on the quality of education of such a nation (Garner, 2004; Garfield & Brimley, 2002; Akanle, 2007). Education has become highly competitive and commercial in many countries. It is on the basis of high academic performance that students get selected to good secondary schools, better courses of study and eventually better jobs. Academic performance has become a yardstick of self-worth and success. The outcome of education determines the quality of life, progress and status of people living anywhere in the world (Devi &Mayuri, 2003).

Academic performance is a complex behaviour. Research has consistently shown that academic performance is not an outcome of any single factor; rather it is the result of the interplay of a large number of factors (Gupta, 1993). Academic performance is an important parameter in measuring success of students. Observations and reports have shown that success or high academic performance has become a herculean task to accomplish by students in recent times. Poor academic performance are recorded both at the secondary and tertiary levels of education in Nigeria (Tenibiaje, 2009). The performance of students at all levels in educational institutions in Nigeria has attracted much criticism from all and sundry from time immemorial. The decline in the academic performance of students in Nigeria had been observed by Soyinka (1999), when he noted that the Nigerian educational system needed restructuring. Many reasons have been advanced as the cause of high rates of failure, including bad study habits, low IQ, faulty teaching methods, erroneous examination systems, social and economic disparities among others. Academic performance (most especially of senior secondary school students) has been largely associated with many factors. Most students in senior secondary schools in Anambra state particularly in Aguata local government area are confronted daily with challenges of coping with academic works under serious emotional strains occasioned by long walk to school, poor school environment and being

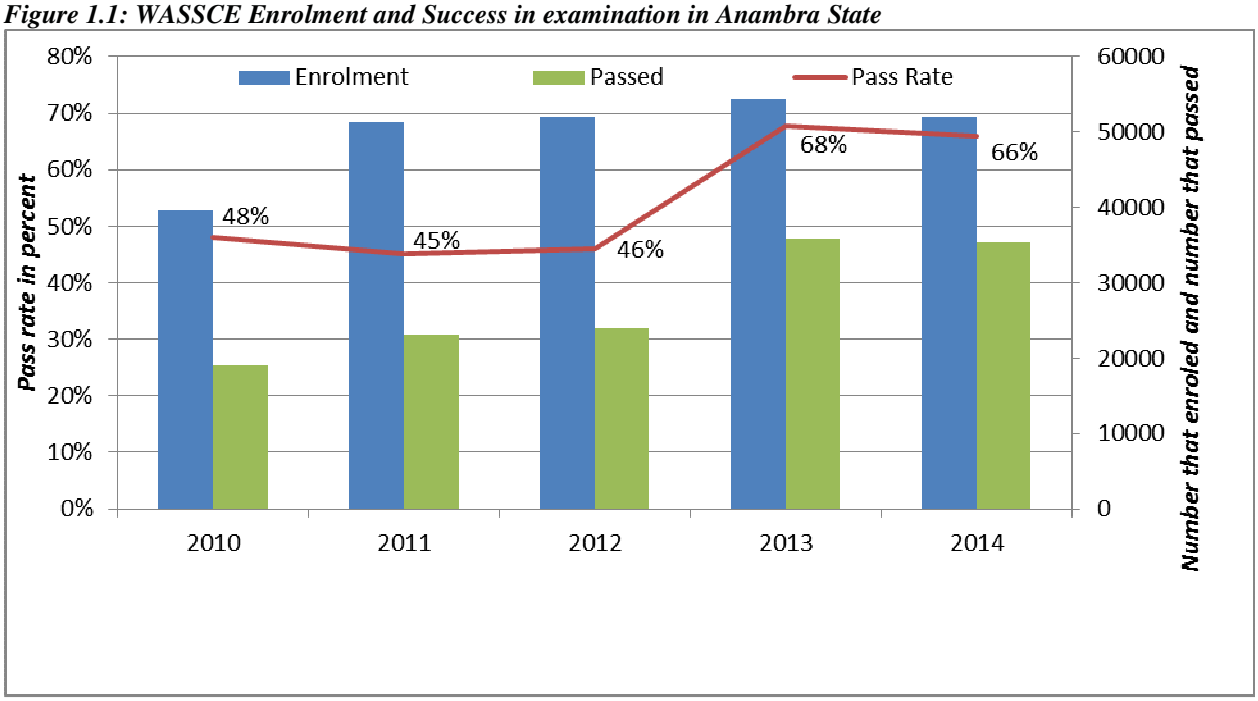
taught by unmotivated teachers. Couple with this, is an uncooperative-to-study attitude of parents who often toil to provide for the needs of the family.

According to Nwokocha and Amadike (2005), academic performance of students is the yardstick for testing educational quality of a nation. Hence, it is expedient to maintain a high performance in internal and external examinations. Parental socio-economic characteristics to a greater extent determine student's performance in school and their adjustment to life**.** The poor examination performance of students in Nigeria in recent times could be attributed to the changing life pattern in some families coupled with economic hardship which has made most families unable to meet up with their responsibilities of ensuring a healthy and literate family. However the impressive performances of students in Anambra state in both West African senior school certificate examination and National examination council in the past three years can be attributed to many factors (Abanobi, 2014). The size of the family in which a child grows affects his intellectual development; this is because in a large-size family, a child may not be given the required attention especially in his/her academics as the family will have more persons to cater for. The issue of home works, payment of school fees, attending parent teachers associations and many more may not be convenient for the parent as they have to cater for many children, while children are well catered for and perform better in small-size family (Udida, Ukwayi and Ogodo, 2012).

Low income of parent is a major impediment to academic success and development on the part of the students. Student's academic performance can be predicted by a chain of social-economic factors resident in parents, family and network (Mohammed, Yinusa and Akanle, 2008). UNESCO (2004) indicated that youngsters from lower socio-economic state are less likely to succeed in school. The social class and economic condition are important factors related to success in school and cannot be ignored (UNESCO 2004). Children of more educated families in Anambra state particularly in Aguata local government area seem to be more ambitious and they do attain higher levels of education. The amount of schooling that parents receive influences how they structure the home environment as well as how they interact with their children in promoting academic performance. The family has the potential to influence a child's academic performance. This is because it is the first environment of the child. The initial experience that would mold 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 financial resources, which are associated with parents' occupation and educational attainment, often imply increased learning opportunities both at home and in school. Better-educated parents can contribute to their children's learning through their day-to-day interactions with their children and involving themselves in their children's school work. In Nigeria particularly in Anambra State, most families are poor and cannot adequately afford three square meals, let alone meeting the educational needs of their children. This indeed has serious implications on the learning and performance of less privileged students in school, as such; students from such families are forced to miss classes, unable to do their assignments and most seriously are driven from school due to non-payment of school fees. All these, have significant effects on the development of the child. Indeed, family background is the foundation for children's development, as such family background in terms of family type, size, socio-economic status and educational background play important role in children's educational attainment and social integration (Osunloye, 2008; Ushie, Emeka, Ononga&Owolabi, 2012). Figure 1.1, for instance, shows the number of persons that enrolled for and passed West African Secondary School Certificate Examination (WASSCE), as well as the pass rates, in Anambra state between 2010 and 2014. Evident in the figure is the wide gulf between enrolment and success in examination.

Figure 1.1: WASSCE Enrolment and Success in examination in Anambra State



Source: West African Examination Council Results (Various Years)

There seems to be a dearth of studies that primarily focus on this area of interest, especially for Aguata local government area in Anambra state. It was observed that previous studies failed to include some key variables such as number of hours of study and power supply and these variables constitute key factors in determining academic performances. This study fills this knowledge gap by incorporating these important variables. In addition, this study also extends the frontier of knowledge by using a different methodological approach in examining the socio-economic determinants of academic performance in Aguata local government area, Anambra state. To this end, this paper is organized as follows: section two contains the review of relevant literature, section three discusses the methods and procedures with which the study is conducted and section four captures the data analysis and discussions while section five concludes the study**.**

2. Review of related literature

2.1. Conceptual Issues

Academic performance is defined or regarded as participants' examination grades (grade point average at the end of a particular semester or programme). It refers to the score attained by an examinee in an administered standardized test. It could also be seen as the level of performance in a particular field of study. Higher scores indicate better academic performance (Egbule 2004).

Socio-economic status is commonly conceptualized as the social standing or class of an individual or group. It is often measured as a combination of education, income and occupation. It is a measure of an individual's or family's economic and social position based on education, income and occupation. Socio-economic background and socio-economic position can therefore be said to be synonymous and thus can be used interchangeably (Gary, Julie, Frank & John 2000).

2.2. Review of basic theories

Human capital investment theory

Becker (1975) developed the human capital investment theory in which he outlined the various interactions paths between income and human capital development. According to the theory, rich parents can invest more financial resources in their children's education. Parents' money can also be used to buy better educational quality, which may affect both current educational performance and children's future demand for education. Moreover, low income parents might push their children towards work in the labour market in order to contribute to family finances; in the absence of sufficient money transfers from their parents children from low income families may decide to work while studying (Dustmann&Micklewright, 2001), with possible negative effects on their school

performance, or decide to quit education at the minimum leaving age to earn money and finance their consumption.

A further mechanism emphasized in the child development literature is that financial problems increase family conflict and parental stress, thus, reducing the ability of parents to engage in effective parenting that improves educational outcomes. The economic literature on the causal relationship between income and educational attainment has a strong emphasis on direct financial investments in children's human capital, (Becker and Tomes, 1986). The underlying theory is of utility maximization over spending on investments in education, consumption and other investments, where the three alternatives are strictly substitutes. While there are clearly some direct investments that parents can make in their children's development (including money for fees and maintenance in higher education) this seems less relevant at early ages.

During childhood a large portion of how income influences attainment is likely to come through as the co-production of education alongside consumption or other investments. Examples of this are the provision of a good home environment through books, toys and outings. Here the books and toys are purchased for current consumption as well as educational benefits. Equally the while housing decision certainly influences school quality, it has other benefits including the investment potential of the house itself.

Systems theory

The systems theory of organizations developed by Ludwigvon Bertalanffy in the 1950s emerged as part of the intellectual ferment following World War II although its roots are much older. Systems theory postulate that schools are like other open systems which of necessity engage in various mode of exchange with environment (Katz and Kahn, 1966 as cited in Mweti, 2013). Systems theory emphases the consideration of the relationships between the school and its environment as well as what goes on within the school (Hall, 1977 as cited in Mweti, 2013). The fundamental concept in the general system theory is the notion of emergence and interaction. As adapted in this study the systems theory holds that socio-economic factors influence students' academic performance in a school. According to the proponents of this theory, these factors are parental level of education, parental involvement in children education, income of parent and financial and material support given to the children by the parent. This theory has its own shortcomings, among which is that the theory assumes that the interrelationships within a system have to be recognized and understood by all people involved. The theory also requires a shared vision so that all people in the school have an idea of what they are to accomplish (Mweti, 2013).

3. Empirical literature review

Khata, *et al.* (2011) conducted a study was to determine if parent educational status influences the educational achievement in high school science. The study utilized the student's grade point average (GPA) for science during high school years to measure achievement. The data for the study came from the national assessment of educational progress (NAEP) high school transcript study (HSTS) 2005. The study compared the mathematics achievement vis-a-vis parent educational statuses and revealed that there were statistically significant differences in science GPA scores between parent educational statuses; however, the effect size was small.

Adeyemo and Babajide (2012) examined the influence of social and economic disadvantage on students' academic achievement in senior secondary school physics. One hundred and ten students were randomly selected across two randomly selected senior secondary schools in Lagos state. From each of the selected schools, the researchers selected fifty five physics students using the simple random sampling technique. Based on result obtained there is no significant relationship between socio-economic disadvantaged students and their academic achievement. Also there is no significant relationship between parental influence and students' academic achievement in physics. Similarly, Yusuf (2012) investigated the influence of family status on undergraduates' academic performance in economics. Questionnaire was administered to 300 randomly selected students from economics department of three universities in Osun State. The study found that family size, parental education and family socio-economic status has no significant impact on academic performance of undergraduates in Economics.

Iqbal and Khan (2012) assessed the relationship between socio-economic conditions of the parents and academic achievements of students at government schools. A random sample of 69 students was selected from all the 16 secondary schools for boys who had passed secondary examination from the board of intermediate and

secondary education. The findings of the study showed a significant relationship between parental socio-economic conditions and academic achievements of the children in secondary examination. Udida, *et al.*(2012) examined the influence of parental socio-economic background on the academic performance of students in selected public secondary schools in Calabar municipal local government area of Cross River state. Multiple regression result revealed that parental socio-economic background significantly influenced students' academic performance, as students whose parents had better jobs and higher levels of educational attainment and who were exposed to more educational and cultural resources at home tended to perform better than their counterparts without such opportunities.

Osuafor and Okonkwo (2013) sought to find out how family background of students 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. Primary data were collected using questionnaire whereas secondary data were obtained from students' SS1 and SS2 school results. The results of the study revealed that family structure, parents' occupation and educational level, did not have significant influence on students' achievement in Biology. In a different study, Alokan and Arijesuyo (2013) investigated the difference between the academic performance of students from rural environment and students from urban environment. The population for this study comprised all public secondary school students in Ondo State. The sample consisted of 240 students from six randomly selected schools. The result publicized that there is no significant difference in the academic performance of students from the two different backgrounds.

Aromolaran, *et al.* (2013) in their empirical survey study conducted to determine the socio-economic factors influencing students' academic performance in Yaba College of technology, collected data from six hundred (600) students across the different departments using a 28 item structured questionnaire. The questionnaire was administered using the quota sampling method, a non-probability sampling technique. The students' academic performance was measured using variable GPA/CGPA categorized into two - poor (GPA/CGPA between 0 and 2.49) and - good (GPA/CGPA between 2.50 and 4.00). Four factors; mothers' education level, living togetherness of parents, student class and weekly income/allowance; were found to influence students' academic performance.

Chandra and Shaikh (2013) examined the relationship between socio-economic status and academic achievement of 14 secondary school students of Lucknow city of Uttar Pradesh, India. The sample of the study comprised of 614 students (358 males and 256 females) from classes IX and X. The results of the study revealed the difference between high, average and low SES groups and their academic achievement. Positive correlation was observed between socio-economic status and academic achievement.

Musarat, *et al.* (2013) studied the ways in which student's academic achievements are effected by parental education and their socio-economic status. Participants were 250 students taken from randomly selected departments. Research findings were generalized to the university of Sargodha students. Data was collected from participants through questionnaire containing three basic variables. Analysis of data using descriptive statistics and ANOVA indicated that students belonging to strong financial status perform better than those who face problems in finance. Similarly, parental education boosts up their children's performance.

Safdar, *et al.* (2013) investigated the relationship between parents' socio-economic status and children academic performance. The study was descriptive and co-relational in nature. Seven hundred and twenty (720) students were sampled from the selected districts. A positive significant relationship of total family income, father's job grade was found with the academic performance of the students. The results of this study, thus, showed that parents' socio-economic status is an important variable that influence their children academic performance.

Nnadi, *et al.*(2016) assessed the socio-economic determinants of gender-based academic performances using field survey of Anambra State, Nigeria. Questionnaires were used to gather data for analysis, while the binary logit estimation and ANOVA techniques were used to test the hypothesis of the study. Findings revealed that there is a significant difference between the performance of female and male students and that number of hours of study is a very important determinant of academic performance. Family size is also a significant factor in explaining academic performance of students. Unexpectedly, parental educational status is not significant in

determining student's academic performance. In addition, parental income is significant in determining student's academic performance and parent's occupations are not statistically significant.

3. Methods and procedures

This study is restricted to Aguata local government area, Anambra state, Nigeria. Aguata has its headquarters in Ekwulobia. The *orient colossus* is the official slogan of Aguata local government area. The towns in Aguata local government where this study was carried out are: Akpo, Achina, Amesi, Aguluezechukwu, Ezinifite, Ekwulobia, Isuofia, Igbo Ukwu, Ikenga, Nkpologwu, Oraeri, Uga and Umuona. This research which is primarily a survey research made use of primary data collected with the aid of well-structured questionnaire. A sample of 1200 students was drawn from SS1 and SS2 students of Aguata local government area, Anambra state.

3.1. Empirical model specifications

The model of this study leans on the systems theory as used by Mweti (2013). According to the theory, a number of variables are expected to influence academic performance. Chief amongst them is parental income, residential area, family size and parent educational achievement. However, power supply and number of hours of study have not been given considerable research attention as witnessed in the reviewed empirical works. Accordingly, the model of this study recognizes variable omission bias. Thus, this study hypothesized that academic performance (AP) is a function of parental income (PI), family size (FS), residential area (RA), parental educational achievement (PEA), power supply (PS) and number of hours of study (NHS).

This is functionally expressed as;

$$AP = F(PI, PS, FS, RA, PEA, NHS) \quad \ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots (1)$$

Expressing the model in an econometric form, we have

$$AP = \alpha_o + \alpha_1 PI + \alpha_2 PS + \alpha_3 FS + \alpha_4 RA + \alpha_5 PEA + \alpha_6 NHS + U \quad \ldots\ldots\ldots\ldots . (2)$$

Where α_o is the constant, $\alpha_{1\ to}\ \alpha_6$ are the coefficients of the independent variables. U is the error term.

The variables and measurements

The variables are measured as follows;

AP = 1 if the student's performance is outstanding (i.e. average score of 70 % and above) and AP = 0 if the student's performance is not outstanding (i.e. average score of less than 70%).

PI is measured by monthly earning of the family head (it is expressed in ten thousands). We choose this approach of rescaling instead of logging the values because we used the estimated coefficients alongside the actual values of the variable to calculate the probability of having high academic performance.

PS = 1 if the student's access to power supply is rated good (i.e. 3 hours and above per day after school hour) and PS = 0 if the student's access to power supply is rated poor (i.e. between 0 and 2 hours).

FS = 1 if the student from a large family (i.e. 7 persons and above) and FS = 0 if the student is from a small family (i.e. less than 7 persons).

RA = 1 if the student resides in the urban area and 0 if otherwise (Residential area doesn't necessarily mean where the school is located but where the student resides).

PEA = 1 if the student's parents are educated (i.e. secondary school and beyond) and PEA = 0 if the student's parents are not educated (i.e. below secondary school level).

NHS = 1 if the number of hours the student studies is rate good (i.e. 2 hours and above daily) and NHS = 0 if the number of hours the student studies is rate poor (i.e. between 0 and 1 hour daily).

U = the stochastic error term which captures other intrinsic or random behaviour that affect AP.

3.2. Estimation technique and procedure

The application of OLS estimation technique to a qualitative response regression model is flawed with numerous shortcomings: (i) Non-Normality of the disturbances *ui*(ii)Heteroscedastic variances of the disturbances (iii) Non fulfillment of $0 \leq E(Yi \mid X) \leq 1$ (iv) Questionable value of R^2 as a measure of goodness of fit, among others (Gujarati, 2004). Hence the maximum likelihood (ML) estimation technique was used to estimate the parameters of the model in equation 2.

Evaluation of estimates

An evaluation of the model consists of deciding whether the estimated co-efficient are theoretically meaningful and statistically satisfactory. In this study there is need for the results to satisfy both the economic and the statistical criteria (first order test).

3.3. Nature and sources of data

The nature of the data is basically primary data gathered through survey method. The study utilized questionnaire for data collection. The questionnaire was chosen because it saves time and it can reach a large number of subjects who are able to read and write independently (Orodho 2004). According to Nkapa, (1997) a questionnaire is a carefully designed instrument for collecting data in accordance with the specification of the research questions. One questionnaire which has two sections was used to solicit data from students and parents on the socio-economic determinants of academic performance.

3.4. Research population and sample

The population of this study is the entire SS1 and SS2 students in Aguata local government area, Anambra state. The sample which is the subset of the population is the selected members of SS1 and SS2 students in Aguata local government area, Anambra state. The reason for the choice of this population and sample is because to the best of our knowledge, no study with the objective of unraveling the socio-economic determinants of academic performances exist for Aguata local government area. Again, Aguata local government area is one of the largest local governments in Anambra state. In addition, we opted for SS1 and SS2 students because it was felt that they are mature enough to give correct answers as against the junior students. SS3 was ignored because they were engaged with the huge task of their external examinations when the questionnaire was distributed.

3.5. Sampling design and sample size determination

The multi-stage sampling technique was adopted for this study enable, first, the selection of schools involved in the study, and second, the selection of the students of the schools. There are about twenty seven private and twenty one public secondary schools in Aguata local government area. The researchers didn't have the resources to conduct a survey of the total research population. In the selection of the schools random sampling technique that allows each individual unit of the population an equal chance of been selected was used. Each category of the schools (public and private) was separately randomly selected. Thus with the aid of random sampling technique the researcher selected twenty private and fifteen public schools making it a total of thirty five schools out of forty eight senior secondary schools in Aguata LGA. This was done to guarantee a comprehensive coverage and in compliance with the laws of statistical regularity and larger numbers.

In the second stage, the SS1 and SS2 students of the selected schools were as well randomly chosen to participate in the study. Simple random sampling was used to select the respondents from the selected schools. Sample size is the number of participants in a given study. Experts have varied opinions on adequacy of a sample. While some are of the opinion that a sample size should be 5 percent of the size of the population, others suggested that it should be at least 10 percent of the population size. Nesbary (2000) is of the view that the larger the sample sizes the greater the probability that the sample will reflect the population. According to Eboh (2009) sample size should match the anticipated analytical approach. Where descriptive analysis is the main approach of the study, the sample size is not as crucial as when the study adopts more quantitative evaluation techniques. A sample of 200 – 500 is considered adequate for more rigorous analysis such as multiple regressions, analysis of covariance or log linear analysis. However the larger the sample, the better. Therefore the sample size for this study is 1200 respondents.

4. Data analysis

To study the socio-economic determinants of academic performance in Aguata of Anambra state, 1200 questionnaire were produced and distributed but 1000 questionnaires were returned and analyzed. This indicates

about 83% response rate. Response rate (also known as completion rate or return rate) in survey research refers to the number of people who answered the survey divided by the number of people in the sample. It is usually expressed in the form of percentage.

Evaluation of research hypotheses

We estimate equation 2 using the of ML-Binary Logit method. This method of estimation is chosen over ordinary least square (OLS) technique because the model is a qualitative response regression model. The conventional OLS estimation produces bias and inconsistent estimation when the dependent variable is qualitative (dummy). The result of this estimation is summarized in a table 4.1.

Table 4.1: Summary of estimation result

Dependent Variable: Academic Performance				
Variable	**Coefficient**	**Std. Error**	**z-Statistic**	**Prob.**
C	-5.107816	0.491580	-10.39060	0.0000
NHS	1.171336	0.388289	3.016664	0.0026
FS	-2.640524	0.404596	-6.526320	0.0000
PS	2.230967	0.422170	5.284527	0.0000
RA	0.550117	0.453324	1.213517	0.2249
PEA	1.379033	0.445937	3.092437	0.0020
PI	0.381857	0.052789	7.2337	0.0000
McFadden R-squared 0.823566				
LR statistic (6 df) 1080.915				

Source: Researchers' Compilation, 2016.

We evaluate the above regression results based on economic criterion and statistical criterion.

(A) Economic criterion

Academic performance and parental income

The result shows that parental income is positively related to educational achievement. This is depicted by the sign of the slope coefficient. By implication, an increase (decrease) in parental income will cause academic performance to increase (decrease). Thus, the parental income coefficient of 0.381857 means, with other variables held constant, that if parental income increases by a unit or by 1 percentage point, on average the estimated logit increases by about 0.381, suggesting a positive relationship between the parental income and academic performance.

Academic performance and family size

The result shows that family size (FS) is negatively related to academic performance, as shown by the negative coefficient of FS. This result suggests that the larger the FS the lower the academic performance. However the FS coefficient is -2.640524. The size of the slope coefficient indicates that if the slope coefficient goes up by 1 percentage point, all other things being equal, the logit goes down by about 2.64 indicating a negative relationship between family size and academic performance.

Academic performance and residential area

The result shows that residential area is positively related to academic performance, as suggested by the positive coefficient of RA. It is worthy to note that the coefficient of residential area is 0.550117. It then means, with other variables held constant, that if residential area increases by 1 percentage point, on average the estimated logit increases by about 0.550, showing a positive relationship between the residential area and academic performance.

Academic performance and parent educational achievement

The result shows that parent educational achievement is positively related to academic performance, as shown by the positive coefficient of PEA. This result suggests that students, whose parents are educated, perform well on the average compared with students whose parents are not educated. A 1 percentage point increase in parental educational, all other things being equal, increases AP by about 1.379 percent.

Academic performance and number of hours of study

The coefficient of NHS is 1.171336 and if the number of hours a student studies increases by 1 percentage point, all other things being equal, the logit increases by 1.171. The result suggests that students who study for longer hours perform better than students who study for shorter hours.

Academic performance and power supply

The result shows that the number of hours a student has access to power supply is positively (coefficient of 2.230967) related to academic performance. The size of the slope coefficient shows that if the number of hours a student has access to power increases by 1 percentage point, all other things are being equal, the logit increases by about 2.230.The result suggests that students who have more access to power supply perform better than students who have little access to light.

Estimation of probability of outstanding academic performance

Following the estimated logit model, we estimated the probability that a student has an outstanding academic performance (i.e., the value 1 for AP) given certain values of the independent variables. To do this, we take hypothetical values for the different independent variables, and substitute them alongside the estimated coefficients into the following equation for estimating probability of success from a logit model:

$$1/(1+e^{-(\alpha o + \alpha 1PI + \alpha 2PS + \alpha 3FS + \alpha 4RA + \alpha 5PEA + \alpha 6NHS)})$$

The equation offers the probability that an individual who has the hypothesized values would have an outstanding academic performance. To implement this, we considered three cases.

Case 1: A student who has a large family size, has power supply for more than 3 hours in a day, resides in an urban area, whose parents has more than secondary school education, studies more than 2 hours in a day, and whose parents has income equal to the mean of the parental income data collected (note that in this case, all the variables except parental income (PI) would have the value 1). Parental income would have the value 11.44363 (expressed in ten thousands) which is the mean of the PI data. Substituting the estimated coefficients and hypothesized values into the equation gives the probability of outstanding academic performance as 0.8757675. This probability is reasonably high, and follows our expectation. The implication is that there is approximately 0.88 probability that a student who has a large family size, has power supply for more than 3 hours in a day, resides in an urban area, whose parents has more than secondary school education, studies more than 2 hours in a day, and whose parents has income equal to 11.44363 would have an outstanding academic performance.

Case 2: A student who has a small family size, has power supply for more than 3 hours in a day, resides in an urban area, whose parents has more than secondary school education, studies more than 2 hours in a day, and whose parents has income equal to the mean of the parental income data collected. Note that in this case, all the variables expect parental income (PI) and family size (FS) would have the value 1. Parental income would have the value 11.44363 which is the mean of the PI data. FS would have the value 0 which corresponds to an individual having a small family size. Substituting the estimated coefficients and hypothesized values into the equation gives the probability of outstanding academic performance of 0.9899837. Clearly, this probability is higher than what we had in the previous case. The implication is that a student who has a small family size, has power supply for more than 3 hours in a day, resides in an urban area, whose parents has more than secondary school education, studies more than 2 hours in a day, and whose parents has income equal to 11.44363 has a higher probability of being an outstanding student relative to a student who has exactly the same characteristics but has a large family size. This difference in probability is about 13.04%.

Case 3: A student who has a small family size, has power supply for less than 3 hours in a day, resides in a rural area, whose parents has less than secondary school education, studies less than 2 hours in a day, and whose parents has income equal to the mean of the parental income data collected. Note that in this case, all the variables expect parental income (PI) would have the value 0. Parental income would have the value 114436.3 which is the mean of the PI data. More so, the implication is that the equation for calculating probability reduces to:

$$1/(1+e^{-(\alpha o + \alpha 1PI)})$$

Substituting the estimated coefficients and hypothesized values into the equation gives the probability of outstanding academic performance as 0.3234454. This result shows that a student who has a small family size, has power supply for less than 3 hours in a day, resides in a rural area, whose parents has less than secondary school education, studies less than 2 hours in a day, and whose parents has income equal to 11.44363 has a small probability (0.3234454) of being an outstanding student.

If we consider the case where this student has a large family size instead of a small one, we find that this student has even less probability of being an outstanding student. To explore this case, our probability equation changes to:

$$1/(1+e^{-(\alpha o + \alpha 1 PI\ \alpha 3 FS)})$$

Substituting the estimated coefficients and hypothesized values into the equation provides the probability of outstanding academic performance of 0.03297396. From the result, we deduce that a student who has a large family size alongside the other characteristics described in case 3 has a strikingly low probability (0.033) of being an outstanding student.

(B) Evaluation based on statistical criterion (1st order test)

(i) ***Coefficient of determination***

According to Gujarati (2003), the conventional measure of goodness of fit, R^2, is not particularly meaningful in binary regressand models. Measures similar to R^2, called pseudo R^2, are available, and there are a variety of them. Eviews presents one of such measures, the McFadden R^2. The McFaddenR^2 ranges from 0 to 1 and measures the goodness of fit of the regression model. From the regression result, the value of McFadden R^2 is approximately 82%, implying that about 82% variation in academic performance is explained by the explanatory variables.

(ii) ***Z-test of significance***

The Z-test is used to test for the significance of the individual parameter in the model, especially when the sample size is very large. It involves comparing the estimated Z-value with the table Z-value at a chosen significant level under a hypothesis.

H_0: $\beta = 0$: the parameter estimate is not statistically significant at 5% significance level.
H_1: $\beta \neq 0$: the parameter estimate is statistically significant at 5% significance level.
If $\alpha = 0.05$, the probability of obtaining a Z-value of -1.96 or 1.96 is 5% (or 2.5 percent in each tail of the standardized normal distribution).

Decision rule:

Reject H_o if calculated Z-value is greater than the critical Z-value in absolute term, otherwise accept it.

Table 4.2: Summary of Z-test for Significance

Variable	Z-calculated	Z- critical	Decision	Remark
PI	7.2337	±1.96	Reject H_0	Statistically significant
FS	-6.526320	±1.96	Reject H_0	Statistically significant
RA	1.213517	±1.96	Accept H_0	Statistically insignificant
PEA	3.092437	±1.96	Reject H_0	Statistically significant
NHS	3.016664	±1.96	Reject H_0	Statistically significant
PS	5.284527	±1.96	Reject H_0	Statistically significant

Source: Researchers' compilation, 2016.

The Z-test for individual significant of each of the parameter estimates shows that all the variables, except residential area is statistically significant at 95% confidence level.

(iii) ***Likelihood ratio (LR) statistic*****:**

The statistics test the null hypothesis that all the slope coefficients are simultaneously equal to zero. Given the null hypothesis, the LR statistic follows the X^2 distribution with degree of freedom equal to the number of explanatory variables. Thus under the hypothesis:

H0: $\beta i = 0$: the parameter estimates are not statistically significant at 5% significance level.
H1: $\beta i \neq 0$: the parameter estimates are statistically significant at 5% significance level.
For i = (1, 2, 3, 4, 5, 6)
$X^2_{0.05}(6) = 12.59$

Decision rule:

If LR statistic > X^2 reject Ho, otherwise accept it.
Our results show that LR statistic of 1080.915 > X^2 of 12.59, we therefore, reject the null hypothesis and conclude that the parameter estimates are statistically significant at 5% significance level.

Correlation between AP and each of the explanatory variables

Unlike the regression coefficient, the correlation coefficient measures the degree or strength of association between two variables. Using pair wise correlation matrix, the summary of the correlation between academic performance and each of the explanatory variables is shown as:

Table 4.3: Summary of the Correlation Result

	AP
AP	*******
NHS	0.782173
FS	-0.596920
PS	0.764524
RA	0.724784
PEA	0.684129
PI	0.774208

Source: Researchers' Compilation, 2016.

The correlation result shows that all the variables except, family size are positively correlated with academic performance. The size of the correlation coefficients show that number of hours of study, family size, power supply, residential area, parental educational achievement and parental income are all strongly correlated with academic performance.

5. Conclusion and policy recommendations

This research work investigated the socio-economic determinants of academic performances in Aguata Local Government Area of Anambra state, Nigeria. The study made use of Qualitative Response Regression Model (QRRM) and contributed to the frontier of knowledge in this area by adopting the maximum likelihood binary logit estimation technique. Key variables (number of hours of study and power supply) omitted in previous studies were incorporated in the model of this study. A sample size of 1200 was covered in obedience to the law of large numbers to guarantee a good, robust and representative outcome. It is worthy of note that this study has theoretical, empirical and pragmatic relevance and its findings can be relied upon for policy making.

On the basis of obtained empirical results, the following policy recommendations become important and apposite: (i) Government employment initiatives should be strengthened while those that are not effective should be reviewed thus creating enabling environment for investment to thrive as this will create jobs which will complement government efforts; (ii) Government's effort to boost power supply should be intensified beyond mere transfer of ownership to the private sector; and (iii) Awareness creation should be intensified on the need for parents to devote more time on the study habits of their children.

References

Abanobi, C. (2014, April 24), "Behold Nigeria's light of education", *The Sunnewspaper*, Retrieved from www.sunnews.online.com.

Adeyemo, S.A., & Babajide, V.T. (2012), "The influence of social and economic disadvantage on students' academic achievement in senior secondary schools physics", *International Journal of Educational Research and Technology* 3(2).

Akanle, O.B. (2007), "Socio-economic factors influencing student's academic performance in Nigeria: Some explanation from a local survey", *Free online library on Sociology and Social work community.*

Alokan, F.B., & Arijesuyo, A.E. (2013), "Rural and urban differential in student's academic performance among secondary school students in Ondo state, Nigeria", *Journal of Educational and Social Research* 3 (3).

Aromolaran, A.D., Oyeyinka, I. K., Olukotun, O.O., & Benjamin, E. (2013), "Binary logistic regression of student's academic performance in tertiary institution in Nigeria by socio-demographic and economic factors", *International Journal of Engineering Science and Innovative Technology* 2 (4).

Becker, G. (1975), "*Human capital",* Chicago: Chicago University Press.

Becker, G., & Tomes, N. (1986), "Human capital and the rise and fall of families", *Journal of Labor Economics* 4, 21-39.

Chandra, R., & Azimuddin, S. (2013), "Influence of socio economic status on academic achievement of secondary school students of Lucknow city", *International Journal of Scientific & Engineering Research* 4 (12)

Devi, S., & Mayuri, K. (2003), "The effects of family and school on the academic achievement of Residential school children" *Journal of Community Guidance and Research* 20 (2), 139-149.

Dustmann, C., & Micklewright, J. (2001). "Intra-household transfers and the part time work of children", *CEPR Discussion Paper 2796.*

Eboh, E.C. (2009), "*Social and economic research principles and methods"*, Enugu: African Institute for Applied Economics.

Egbule, J. F. (2004), "*Practical guide to a successful project or thesis writing and defense"*. Owerri: Whyte and Whyte Publishers.

Essien, I. T. (2002), "Influence of home environment on secondary school students' achievement in Geography in Akwa-Ibom state", *Journal of the Nigerian Society for Educational Psychologists (NISEP)* 1 (1), 109-116.

Garfield, R. R., & Brimley, V. J. (2002), "*Financing education in a climate of change*" Boston: A Pearson Education Company.

Garner, C. W. (2004), "*Education finance for school leaders: Strategic planning and administration",* New Jersey: Upper Saddle River.

Gary, M., Julie, M., Frank, J., & John, A. (2000), "*The measurement of socioeconomic status for the reporting of nationally comparable outcomes of schooling",* Canberra: Australian Council for Educational Research & Sociology

Gujarati, D.N. (2003*)," Basic Econometrics (*4th edition)", New Delhi: McGraw Hill

Gupta, M. (1993), "*Determinants of academic achievements",* New Delhi: Intellectual Publishing House.

Iqbal, A. & Khan, N. (2012), "Relationship between parental socio economic conditions and student's academic achievements: A case of District Dir, Timergara, Pakistan", *Global Advanced Research Journal of Educational Research and Review* 1 (7), 137-142.

Khata, M.J., Machtmes, K., Kungu K., Buntat, Y., & Nordin, M.S. (2011), "Does parental education status matter on the student's achievement in science", *International Conference on Social science and Humanity*.

Muhammed, A., Yinusa, A., & Akanle, O.B. (2008), "Socioeconomic factors influencing student academic performance in Nigeria, some explanation from a local survey", Retrieved from http; //www. medwelljournals.com/abstract.

Musarat, .A., Sundus .N., Faqiha N., Fozia, P., & Ayesha , S. (2013), "Impact of parental education and socio – economic status on academic achievements of university students", *International Journal of Academic Research and Reflection* 1 (3)

Mweti, J.M. (2013), "Socio–economic factors influencing student's academic performance in public secondary schools in Igembe south district, Kenya", *Unpublished M.ED Project, University of Nairobi*.

Nasbery, D.K. (2000), "*Statiscal Methods* (39th ed)*",* New Delhi: Sultan Chand & Sons Educational Publishers.

Nkapa, M. (1997), "*Educational research for modern scholars*", Enugu: Dimension publisher.

Nnadi, K.U., Dimnwobi, S.K., Nwokoye, E.S & Ekesiobi, C.S. (2016), "Socio-Economic Determinants of Gender-based academic performances in Anambra state", A paper presented at the 5th International conference on gender and the sustainable development goals: Issues and Challenges, organized by Institute of women, gender and development studies, Federal University of Technology, Owerri, Imo State, 22nd – 25th February.

Nwokocha, A. C., &Amadike, N. N. (2005). A comparative study of academic performance in public and private secondary schools in River state. *Nigerian Journal of Educational Administration and Planning, 5* (2), 188-191.

Obasi, O.K. (1999), "The influence of the students' family background on their academic achievement as perceived by students in Aboh Mbaise L.G.A", *Post Graduate Diploma Thesis, Imo State University*.

Okeke, E. A. C. (2009), "Attracting women into science-based occupations: Problems and Prospects", In Nnaka, C. and Njoku, Z. (eds). *Gender and STM Education Series,* 89-108.

Orodho.J. (2004), "*Techniques writing Research proposal and reports"* Nairobi: Masola publishers

Osuafor, A., & Okonkwo, I. (2013), "Influence of family background on academic achievement of secondary school biology students in Anambra state" *An International Multidisciplinary Journal, Ethiopia* 7 (3), 156-167.

Osunloye, A. (2008), "Family background and student academic performance", Retrieved from *http://socyberty.com/education/family-background-and-student-academic-performance/*

Safdar, R. G., Karim, .N.¸ Saqib, S., & Gulap, S. (2013), "Relationship between parents' socio –economic status and their children academic performance", *International Review of Social Sciences and Humanities* 5 (2), 58-65.

Soyinka, W. (1999), "*University System in Nigeria*.",Tampere: University of Tampere Press.

Tenibiaje, D. J. (2009), "Influence of family size and family birth order on academic performance of adolescents in higher institution", *Pakistan Journal of Social Sciences,* 6 (3), 110-114.

Udida, L.A., Ukwayi, J.K., & Ogodo, F.A. (2012), "Parental socioeconomic background as a determinant of student's academic performance in selected public secondary schools in Calabar municipal local government area, Cross River State, Nigeria". *Journal of Education and Practice* 3 (16)

UNESCO (2004), "*The challenges of achieving gender parity in basic education",* Paris: United Nations Educational Scientific and Cultural Organization.

Ushie, M. A., Emeka, J. O., Ononga, G. I., & Owolabi, E. O. (2012), "Influence of family structure on students' academic performance in Agege local government area, Lagos state, Nigeria," *European Journal of Educational Studies* 4 (2), 177-187.

Yusuf, A.F. (2012), "Influence of family status variables on undergraduates academic performances in economics: Implications for counseling", *Online Journal of Social Sciences Research* 1 (6), 185-191.