Determinants of Academic Success in Agricultural Science Subject among Senior Secondary School Students

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Abstract

The study examined determinants of academic success in Agricultural science among senior secondary school students in Oru L.G.A. of Imo State, Nigeria. Cross sectional data generated from 200 students drawn from 2 secondary schools randomly selected from the lists of secondary schools in Oru L.G.A of Imo State was used. Descriptive statistical tools such as percentages and frequency tables, as well as regression analysis were used in analyzing the data. Results of the analysis showed that likeness or interest in agricultural science subject by the students, occupation of the parents of the students, type of accommodation which symbolized environmental influence on the students, the level of teaching experience possessed by the teachers, level of class attendance by the students, togetherness of the parents and the educational level of the parents of these students were statistically significant determinants of academic success in agricultural science subject among senior secondary school 1 and 2 students in the State. It is therefore recommended that the Government should boost and sustain the interests of these students through the provision of the requisite instructional materials. The recruitment of qualified and well experienced teachers was also advocated in order to sustain the interests in agricultural science subject.

Keywords: Success, Senior Secondary Students, Agricultural Science

Introduction

There are various factors that may potentially influence academic success or performance generally. But how predictable are the academic success of agricultural science students in Nigeria? As a group, agricultural science students pose many different intelligence levels, behaviors, lifestyles, study skills and habits, preferred learning methods, experiences backgrounds and demographics. The interactions between these factors make it difficult to have an *a priori* prediction on how successful any given agricultural science student will be. One begins to wonder whether statistical analysis of generally available information in most secondary schools official record systems about students engaged in vocational subjects such as agricultural science can identify with ease factors that predict these students level of academic success.

Previously published works have considered a variety of potential predictors of academic success for students generally. These studies concentrated on variables that attempt to measure students intellect and

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non intellectual variables; that attempt to measure personality traits, behavioral tendencies, and demographic characteristics. Furthermore, some studies (Cabrera, Nora and Castaneda, 1993, Eimers and Pike 1997, Noble, Davenport, Schiel, and Pomerich, 1999) have shown that intellectual variables can be useful predictors of over all academic performance.

Non intellectual variables as predictors of students' academic success have also attracted the attention of some other researchers Nonis, Philhours, Syamil, and Hudson, 2005, JournalHarackiewicz, Barron, Tauer and elliot, 2002 and Brookshire and Palocsay, 2005). Variables considered as non intellectual include demographic, behavioral and personality characteristics. Time spent in school such as school attendance for class work, or preparation for examinations and assignments constitute behavioral variables, while personality variables include self-assessed measures proposed to measure the level of students' academic motivation (achievement striving) and their confidence in their own abilities (self - efficacy).

Demographic variables on the other hand, include gender, age, race/ethnicity, and marital status. Allen, Carter and Wiant (2007) who investigated the determinants of academic success for undergraduate finance students in U.S.A. concluded that certain demographic variables (age, gender, and ethnicity) may also be useful indicators of students' overall academic success.

Research on academic achievement will continue as long as the desired outcome of learning is performance. Although recent studies have shown that academic performance among secondary school students leave much to be desired especially in the sciences (Anyanwu, 2007), there is every need for scholars to continue to explore this frontiers of knowledge with a view to identifying more psycho-social determinants of academic success. Numerous studies such as those conducted by Fullana (1995) and Montero (1990) sought to understand the factors which accounted for low achievement.

Studies geared towards identifying what determines academic failures frequently appear as reaction to conditions of change, such as plans for educational reforms, or in response to critical situations.

Tapia (2002) argued that the appropriate measure for determining academic failure is whether the student performed below his or her potential ability. In general the various studies which attempt to explain academic failures do so beginning with the three elements that intervene in education. These factors include (family causal factors), teacher (academic causal factors) and students (personal causal factors). The most commonly studied among personal causal factors are motivation and self-concept. Motivation is the element that initiates the subject's own involvement in learning. When a student is motivated to learn, all his efforts and personalities are directed towards the achievement of the specific goal, thus bringing to bear, all his or her resources.

Statement of the Problem

Concise knowledge of the factors that influence academic success has important implications for learning and education generally. Many educators for example, are interested in knowing beforehand who will perform well, and who will perform poorly, in academic programs (O'Connor and Paunonen, 2007).

Various studies such as those conducted by Fullana (1995), Monterol (1990) have sought to understand the factors which account for low achievement. Studies seeking to identify what determines academic failure frequently appear as response to critical situations. Cognitive ability is one important determinant of academic achievement (Ackerman and Heggestad, 1997). But Chamorro-Premuzie and Furnham, (2006) argued that ability factors alone cannot sufficiently account for individual differences in academic success. Therefore, researchers have sought to identify non-cognitive predictors of academic success. Studies on the relationship between scores of senior secondary students in agricultural science in Imo State are scanty. The present study therefore examines the role of behavioral factors, students' factors and teacher factors in the determination of academic success in agricultural science subject among senior secondary school students in Imo State of Nigeria, ostensibly to bridge this gap in knowledge.

The general objective of the study is the determination of the factors influencing academic success among secondary school students in agricultural science in Imo State of Nigeria. The specific objectives include:

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(i) the determination of the socio-economic characteristics of the senior secondary school, agricultural science students,

(ii) ascertaining the determinants of academic success in agricultural science among senior secondary school students and

(iii) to make recommendations for improvement.

Significance of the study

This study will not only provide insight into some of the behavioral problems that impact negatively on the academic performance of students, but will also enrich current literature on the influence of teacher related variables on academic success of students in agricultural science in Imo State. Knowledge of the impact of demographic factors on academic success of students will guide policy makers in the design of appropriate policies to arrest the falling standards of education, especially where such factors are domiciled in demography. Furthermore, identifying the determinants of academic success will be of tremendous assistance in the effort to develop curricula aimed at improving the levels of academic performance among senior secondary school students in agricultural science.

Research Questions

The research questions are as follows:

(a) What are the socio – economic characteristics of senior secondary school agricultural science students in Imo State, Nigeria?

(b) What are the determinants of academic success in agricultural science among senior secondary school students in Imo State, Nigeria?

Methodology

The study was carried out in Imo state. The State is located in the south eastern part of Nigeria. According to the National Population Commission (2006) Imo State has a population of 3,934,899 people with an annual growth rate of 3.2 per cent. The state lies between longitude 6°   4' East and latitude 4° 4' and 8° 15' north.

Data Collection

The data for the study was collected from two secondary schools in Imo state. The population of the study includes all agricultural science students in senior secondary schools 1 and 2 in each of the two schools. From each of these schools, 50 students each were randomly selected from SS1 and SS2 classes using simple random sampling method. This gave a total sampling size of 200 students.

Data Analysis

The first objective was achieved using descriptive statistics such as means, percentages and frequency tables. The second objective was achieved with the aid of regression model implicitly stated as:

$Y = f(x_1, x_2, x_3, x_4, x_5, x_6, x_7, x_8, e)$

Where

Y = Score of the student (%)

X_1 = Age of the students (years)

X_2 = Likeness for education (1 for yes, 0 for No)

X_3 = Students attendance (Number)

X_4 = United family 1, Separated 0

X_5 = Level of education of father (years)

X_6 = Academic related occupation = 1, zero otherwise

X_7 = Accommodation type (1 for flat, zero for yard)

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X_8 = Teacher's experience (Years)

e = error term

Four functional forms, namely, the linear, semi log, double log and exponential functions were fitted to the data. The best fit was selected based on the sign and sizes of the estimated parameter and the magnitude of the coefficient of multiple determinations.

Results and Discussion

Scores in Agricultural Science

Table 1: Frequency Distribution of Students scores and age

Scores	Frequency	Percentage
60-69	20	10
70-79	30	15
80-89	70	35
90-99	80	40
Total	**200**	**100**
Age		
13	10	5
14	60	29.7
15	100	49.5
16	30	14.9
Total	**200**	**100**

Source: Field survey, 2012

Table 1 shows that majority of the students sampled scored between 80% and above in their examination which is indicative of both likeness and interests in the subject and appreciable knowledge of the subject by the teachers.

Table 1, also shows that about 50% of the students were 15 years of age. At this age they will be able to understand the agricultural science curricular in senior secondary one and two. Maturity is positively related to the psychological and cognitive development of the students.

Regression Results

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Results of the data analysis are presented in Table 2. In the linear model, seven out of the eight explanatory variables were statistically significant at 5% level of probability. While some of the explanatory variables possessed the expected signs, others did not conform to *a priori* expectations. In the semi log and double log models, only three of the explanatory variables were statistically significant at 5% level of probability. In the exponential function, five of the explanatory variables were statistically significant at 5% level of probability. The coefficient of multiple determinations for the linear, semi log, double log and exponential functions were 0.662, 0.743, 0.728 and 0.428 respectively. Therefore, based on the signs and sizes of the estimated parameters and the magnitude of the coefficient of multiple determinations, the linear model is selected for further analysis of the data.

Table 2: Regression results on the determinants of Academic Success among Agricultural science students in Oru L.G.A. of Imo State

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Explanatory variables	Linear	Semi Log	Double Log	Exponential
Constant	66	-771.25	-2.431	1.804
Age	.381 (0.519)	657.30 (8.55)***	3.353 (8.133)***	0.008 (1.556)
Likeness	16.58 (12.64)***	-	-	0.014 (2.23)**
Occupation	-2.295 (-2.166)**	-	-	0.005 (0.759)
Accommodation	8.45 (3.57)***	-	-	0.146 (9.636)***
Teachers experience	0.311 (2.69)***	73.86 (7.13)***	0.376 (6.761)***	-0.003 (-2.175)**
Attendance	0.031 (2.61)**	6.144 (0.892)	0.032 (0.853)	0.000 (3.021)***
Togetherness	-15.89 (-5.123)***	-	-	-0.150 (-6.953)***
Parents education	-0.265 (-2.722)***	-17.23 (-2.204)**	-0.096 (-2.28)**	0.000 (-0.414)
R^2	0.662	0.743	0.728	0.428
F-ratio	46.736	39.73	36.736	17.865

Source: Field survey, 2012.

In the linear model, likeness or interests in agricultural science subject by the students, occupation of the parents of the students, type of accommodation which symbolized environmental influence on the students, the level or years of teaching experience possessed by the teachers, level of class attendance by the students, togetherness of the parents and the educational level of the parents of these students were statistically significant at 5% level of probability. Age of the students, likeness of Agricultural science as a subject, type of accommodation where these students lived outside the school environment, teaching experience of the teachers and class attendance possess the expected positive signs. This implies that increases in these explanatory variables will all things being equal result in increases in the scores recorded in agricultural science subject in the examinations and in academic success. Similarly, the inverse relationship between Types of occupation engaged in by the parents of these students which were not related to academics, such as trading, reduced the assistance they could have derived from their parents in their home works.

The positive relationship existing between age and the score achieved by the student conforms to a priori expectation because the students have to mature chronologically to be able to comprehend agricultural science. This understanding will naturally be reflected in the scores recorded in the examinations. The reverse is also the case, where the students are not matured enough to appreciate the subject matter. Cognitive development of the students is positively correlated to their ages.

If the students hate agricultural science as a subject, this is expected to influence their scores during examinations. Any student that manifests hatred for any subject will naturally receive low scores in such subjects. Results of data analysis show that likeness for agricultural science subject is statistically significant at 5% level of probability and possessed the expected positive sign. This shows that as the likeness or interests of the students in agricultural science subject increases, it impacts positively on the students' scores. This is a psychological reality. The reverse is also possible.

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Environments exert a lot of influence on the students. If the environment is conducive to academic activities especially after school hours in the homes (for the day students), this will naturally result in higher scores achieved by the students. But if the environment is noisy as obtainable in many yards, make shift accommodations and the likes, the students may not have enough time to go through their notes in their homes. This must have been the wisdom behind the existence of boarding houses in some schools. Students who live in flats may have better opportunities relative to their counterparts who are not so endowed. Results show that students who lived in flats achieved higher scores in agricultural science relative to their counterparts who lived in yards. In other words, type of accommodation where the students reside after school hours is positively correlated with the scores achieved in agricultural science examinations.

A well experienced teacher is an asset both to the students, the school and the nation at large. This is because, the teacher knows how to present his subject matter, communicate effectively and impart knowledge to the students. The reverse is also obtainable where the teacher is inexperienced. A bad workman quarrels with his tool. Where the teacher is well experienced, the students will easily understand the subject of agricultural science and this will be made manifest in their scores. Results show that the level of teaching experience possessed by the agricultural science teacher is statistically significant and positively correlated with scores achieved by the students in agricultural science examinations.

Attendance to classes is an indispensable prerequisite for success in any academic activity in the schools especially among secondary schools. This explains why both the school authorities and the government places premium on school attendance. Truancy is often frowned at because of its negative influence on students' academic performance. The register is therefore one of the important documents or records kept at schools. These registers are regularly marked every day by the class teachers, ostensibly to check truancy. Results of data analysis, show that attendance to classes is both statistically significant at 5% level of probability and also positively related to academic success in agricultural science. In other words increase in class attendance impacts positively on the scores achieved by the students in agricultural science examinations.

Type of occupation engaged in by the parents of these students is statistically significant at 5% level of probability and inversely related to the scores achieved by the students. The parents of majority (60%) of these students were business men and women, office workers and traders, while only 40% have occupations (teaching, etc.) that avail them of the opportunity of assisting their wards at homes whenever they come back from their schools and ensuring that assignments are properly done.

Explanatory variables such as level of education of the parents and whether the parents are living together or separated did not conform to a priori expectations. Allen, Carter, and Wiant (2007) who investigated the determinants of academic success for undergraduate finance students in the United States of America lamented that "the complexities of the interactions between these factors make it difficult to predict a priori how successful any given student will be in an undergraduate business program". Under normal circumstance, the level of education of the parents of these students will stimulate their desire for higher academic achievement. Probably such stimulation may manifest in the choice of career and not necessarily in academic success such as higher scores or grades in examinations.

The coefficient of multiple determinations ($R^2 = 0.662$) shows that the explanatory variables included in the model jointly explained about 66.2% of the variations or academic success of the students. The F- ratio of 46.74 which is statistically significant at 5% level of probability, shows further that the model is a good fit for the data and adequately explained the determinants of academic success represented by scores in examinations of agricultural science students.

Summary

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Students generally, pose many different intelligence levels, behaviours, lifestyles, study skills and habits, preferred learning methods, experiences, backgrounds and demographic characteristics. The fluidity of students' demographics necessitated periodical determination of the factors influencing academic success among secondary school students. This study was designed to investigate the determinants of academic success among agricultural science students, in secondary schools in Imo State, Nigeria.

Two hundred students were randomly selected from SS1 and SS2 from two schools in Imo State. Descriptive statistical tools such as frequency tables and percentages as well as regression analysis were used in analyzing the data. Results showed that the determinants of academic success among agricultural science students in Imo State, Nigeria, include, likeness of agricultural science by the students, occupation of the parents of the students, type of accommodation which symbolized environmental influence on the students, the level of teaching experience possessed by the teachers, level of class attendance by the students, Togetherness of the parents and the educational level of the parents of these students.

Conclusion

It is therefore concluded that if students like agricultural science subject and their parents engage in academically related disciplines such as teaching, the students will most likely be successful in agricultural science subject in the secondary schools. Furthermore, if the students live in conducive environments typified by flats as opposed to yards, have high class attendance and taught by well experienced teachers, the tendency would be that such students will be successful in their academics.

Recommendations

Journalist is therefore recommended:

(1) That the government should encourage the teaching and learning of agricultural science through the provision of the requisite instructional materials to stimulate and induce the interests of students in the studying of agricultural science

(2) Furthermore, well experienced teachers should be recruited to make the process of teaching and learning more effective.

(3) Boarding facilities should be built by the governments to encourage students to live within the school premises. This is expected to increase class attendance and reduce truancy.

References

Ackerman, P. L. and E.D. Heggestad (1997). Intelligence, personality and interests:
    evidence for overlapping traits. *Psychological bulletin*, *121*, 219-245.

Allen, M.T., C.C.Carter, and K.J. Wiant (2007). Investigating the determinants of academic
        success for undergraduate finance students, Florida Atlantic University, College of
        Business 2912 College Avenue, Fort Lauderdale, Florida 33314

Anyanwu, S.O.(2007). A critical look on the fourth edition of the National
        Policy on Education and evaluation of success or achievements of the
        avowed goals for Nigerian education. *The Architects Interdisciplinary
        Journal of Academic Architects in Nigeria, 4*(3), 36-49.

Brookshire, R.G. and Palocsay, S.W. (2005). Factors contributing to the success of
        undergraduate business students in management science courses. *Decision
        Sciences Journal of Innovative Education*, *3*(1), 99-108.

Cabrera, A.F., Nora, A and Castaneda, M.B. (1993). College persistence: structural
        modelling test of an integrated model of students retention. *Journal of
        Higher Education 64*(2), 123-139.

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Chamorro- Premuzic, T. and A. Furnham (2006). Intellectual competence and intelligent personality: A third way in differential psychology. *Review of General Psychology, 10*, 251-267.

Eimers, M.T. and Pike G.R.(1997). Minority and non minority adjustment to college: differences or similarities? *Research in Higher Education, 38*(1), 77-97.

Fullana Noel, J.(1995). An investigation into school success and failure from the perspective of risk factors: implications for educational research and practice, Tesis Universitat de Girona Departamento de Pedagogia.

Harackiewicz, J.M., Barron, K.E., Tauer, J.M.and Elliot, A.J.(2002). Predicting success in college: a longitudinal study of achievement goals and ability measures as predictors of interest and performance from fresh men year through graduation. *Journal of Educational Psychology*, *94*(3), 562-575.

Montero, M.C. (1990). Predicting academic performance: A study of intervening variables in a sample of 8th grade students with follow-up in 10th grade" Tesis Universidad, Pontificia de Salamanca.

National Population Commission (2006). Population Census of Nigeria, Government Press, Abuja, Nigeria.

Noble, J. Davenport, M., Schiel, J., and Pomerich, M. (1999). Relationship between non cognitive characteristics, high school course work and grade, and test scores of ACT- tested students. *ACT Research Report Series*, 99-4, Iowa City, I. A. American College Testing Program.

Nonis, S.A., Philhours, M., Syamil, A. and Hudson, G.I. (2005). The impact of non intellectual variableson academic success of business Students. *Marketing Education Review*, *15* (3), 51-63.

O'Connor, M.C. and S.V. Paunonen (2007). Big five personality predictors of post-secondary academic performance. *Personality and Individual difference*, 43, 971-990.

Tapia, A. (2002). Una propuesta contra el fracaso escolar. (a proposal against failure). Ilustre Colegio Oficial de Doctores y Licenciados en Filosofia y Letras y en Ciencias, 133,10-   12.