INFLUENCE AND IMPLICATIONS OF SCHOOL LOCATION ON THE ACADEMIC PERFORMANCE OF STUDENTS IN AGRICULTURAL SCIENCE

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Abstract

This paper investigates the effect of urban and rural locations on performance of agricultural science students at the school certificate level. Result of secondary school students in 3 states and involving 8,425 candidates in 3 years (1996-1998) were used for the study. Data were analyzed using chi-squares. Results of the study showed that the performance of the urban school candidates were by far superior to those of their rural counterparts in all the years studied. The implications of the study for education as well as measures to be adopted to ameliorate the situation are highlighted.

Introduction

Agriculture is one of the subjects whose study and practice has contributed immensely to the improvement of the nation's economy. It provides the nation with food, employment, industrial raw materials, income and foreign exchange as well as enhances environmental beautification. It is an applied science with emphasis on the acquisition of knowledge and practical skills needed for employment as it provides technical background that increases students understanding for the field work (Emiola, 1996). It was the recognition of these immense roles that the Nigerian government has included it as a core subject in the both the junior and senior secondary schools curricular, (Federal government of Nigeria, 2004). This, it is believed will help give agriculture the required boost as witnessed in the USA during the 20^{lh} century which in the main was due to the training provided her higher school students in vocational education in Agriculture, (Burket, 1976).

Nigeria has 2 distinct communities classified with respect to population density, size, economic activities, living standards as well as socio-cultural homogeneity/heterogeneity. Rural areas are those with low population density, small size and relatively isolated and where the economic activities are extractive in nature and the people are relatively homogenous in language, culture, attitudes and behaviour. In the urban communities the occupations are much more specialized, there are wide variations in terms of the people's interest, culture, language, behavioural patterns and occupations. There are also a highly improved standards of living with high provisions of home conveniences, public utilities as well as in the existence and provisions of educational, recreational and religious facilities, Okafor and Onokerhoraye, (1994), Omoradia and Onokerhoraye, (1995).

According to Adebayo (2005) rural areas have less than the population of 10,000 people and lack basic social amenities while urban areas have populations exceeding 10,000 people and are more viable in economic and social activities. In terms of education Ekwarghariri (1972), holds the view that schools in rural areas of Nigeria are poorly staffed and equipped, have inadequate social amenities and timetable while those in urban areas have well qualified teachers and fairly well equipped with laboratories and libraries. Olaitan (1985), also found out that urban schools were better staffed/equipped than rural schools while rural schools have a great deal of land for acquiring practical agricultural experience and the predominant agricultural occupations of parents would positively influence the students performance.

Many factors are known to affect the educational achievement/attainment of students. They include such factors as sex, school location and type (boarding or day), teacher qualification and cognitive styles. They also include students' interest, psychological frame, personal experience, peer group, reactions towards examinations, parents' socio-economic status and motivational materials (Balogun, 1979; Odili, 1989; Komolafe, 2002).

By far the greatest contributing factor in academic success is the school environment, Fagbanyie (1977). Ekwarahariri (1972), in a survey had shown that educational expenditure, salary and motivational materials are factors of the educational environment and resources that affect academic performance of school pupils. Iyewarun (1983), specifically pinpoints congenial relationship between teachers and students as the most important factor. However, Walberry and

Allengreen (1970); Komolafe, (1991) and Komolafe, (2002) had demonstrated that much of the differences in pupils performance could be attributed to the learner and learning location while a small proportion are due to instruction variable.

The influence of location on the academic achievement of pupils has been reported by a number of researchers. The findings can however be said to be inconsistent or at best inconclusive. Olaitan (1985), compared the academic performance of pupils in agriculture in both urban and rural locations and found that in spite of the mass exposure to agricultural activities the rural pupils did not perform better than urban pupils. Studies by Jegede (1984) and Inomiesa (1989), also reveals that urban location had no significant influence on pupil achievement indicating that academic experience could be obtained irrespective of students' school location. On the other hand, study by Daramola (1983), Adebule and Omirin (2004) and Adebayo (2005), had revealed significantly greater performance of urban students than rural (non urban) students.

It is necessary to find out how secondary school students differ with respect to school location in their achievement in agricultural science. Such a finding will provide data that would help counsel educationists on how best to harness available educational environment and resources to enhance higher educational attainments of the achieving groups. Other policies such as those that would help stimulate student interest and subsequent learning would also be enunciated for implementation.

Research Questions

This study is therefore meant to answer the research questions:

(1) Is there any difference in secondary school students achievement in agricultural science between urban and rural in the year 1996?"

(2) Is there any difference in secondary school students achievement in agricultural science between urban and rural in the year 1997?"

(3) Is there any difference in secondary school students achievement in agricultural science between urban and rural in the year 1998?"

(4) Is there any difference in secondary school students achievement in agricultural science between urban and rural in the years 1996-1998 combined?"

To answer the question the following null hypotheses were stated

1. There is no difference in performance between the the urban and rural school students in year 1996.
2. There is no difference in performance between the the urban and rural school students in year 1997.
3. There is no difference in performance between the the urban and rural school students in year 1998.
4. There is no difference in performance between the the urban and rural school students in years 1996-1998 combined.

Each hypothesis was tested at 1% level of significant ($p<0.01$). The Ho was rejected when the probability level associated with the null hypothesis is equal to or less than 0.01.

Methodology

Three states in the southeastern Nigeria (Anambra, Imo and Ebonyi states) where used for the study. 4 urban and 4 rural schools were randomly selected from each of the states making a total of 8 schools per state and 24 schools in all. The school certificate results of students in agricultural science in the selected schools over three years (1996-1998) were the sample population. In all results of 8425 students were used.

The school certificate results of the students for each year were classified into 3:

Alpha (1-3) High-grade pass
Credit (4-6) Low grade pass and
Fail (7-9)

A chi squared (X^2)test of hypothesis or significance was then used to test the null hypotheses that there was no difference in the performance of the students in 1996, 1997, 1998 and the three years combined. In each case the computed value given by £ $\underline{(Fo-Fp)^2}$ is compared with the tabulated critical values at 0.05 and 0.01 significant levels respectively. If the calculated chi square is greater than the tabulated critical value, Ho will be rejected and the conclusion will be that the observed frequencies differ significantly from expected frequencies.

The additive property of chi square (Spiegel, 1972) was finally used to test the Ho that there was no difference in performance between urban and rural students in school certificate agricultural science over the three years combined.

Results

Testing Research Question I

Table I: (a): 1996 Observed and Predicted Frequencies of Urban and Rural Schools in Ebonyi, Anambra and Into States

School	Alpha	Credit	Fail	Total
	UA	UC	UF	
Urban Fo	419	633	1008	2060
Fp	350.84	568.77	1140.40	
	RA	RC	RF	
Rural Fo	72	163	588	823
Fp	140.16	227.23	455.61	
Total	491	796	1596	2883

Table 1, shows the 1996 observed and predicted frequencies in Ebonyi, Anambra and Imo states. Out of a total of 2060 students observed frequencies ranged from 419 alpha grades 633 credit grades and 1008 failure grades in the urban schools. In the rural schools out of a total of 823 students, the alpha, credit and failure grades were respectively 72, 163 and 588 respectively.

Table II Calculation of Chi-square Values for Table II

Group	Fo	Fp	Fo-Fp	$(Fo-Fp)^5$	$\frac{(Fo-Fp)^2}{Fg}$
UA	419	350.84	68.16	4645.79	13.24
UC	633	568.77	64.23	4125.49	7.25
UF	1008	1140.40	-132.4	17529.76	15.37
RA	72	140.16	-68.16	4645.79	33.15
RC	163	227.23	-64.23	4125.49	18.16
RF	588	455.61	132.39	17527.12	455.61 1542.78

Table II above shows that £ $\frac{(Fo-Fp)^2}{Fp}$ = 542.78 while the df = (r - 1)

(c - 1 = (3 - 1) (2 - 1) = 2. The chi-square was used to test the Ho that there was no difference in performance between urban and rural school candidates in the school certificate examination in 1996. But the table value at 0.05 and 0.01 significant levels are 5.99 and 9.21 (Koosis, 1977). This shows great disparity between observed and predicted frequencies in the 3 states in 1996. The null hypothesis is therefore rejected. There is therefore enough evidence to conclude that there is a difference between the performances of urban school candidates. In fact the urban school candidates performed much better than rural school candidates in 1996.

Testing of Research Question II

Table III 1997 Observed and Predicted Frequencies of Urban and Rural Schools in Ebonyi, Anambra and Imo States

School	Alpha	Credit	Fail	Total
	UA	UC	UF	
Urban Fo	299	510	1030	1839
Fp	225.15	445.32	1168.52	
	RA	RC	RF	
Rural Fo	17	115	610	742
Fp	90.85	179.68	471.48	
Total	316	625	1640	2581

Table III shows the 1997 observed and predicted frequencies of urban and rural schools in Ebonyi, Anambra and Imo states. Out of the total of 2581 students the urban schools had 299 alpha, 510 credit and 1030 failure grades while the rural schools had 17 alpha, 115 credit and 610 failure grades.

Table IV Calculation of Chi-sc luare Values for Table III

Group	Fo	Fp	Fo-Fp	$(Fo-Fp)^2$	(Fo-Fpj[1] fE
UA	299	225.15	73.85	5453.82	24.22
UC	510	445.32	64.68	4183.50	9.39
UF	1030	1168.52	-138.52	19187.79	16.42
RA	17	90.85	-73.85	5453.82	60.03
RC	115	179.68	-64.68	4183.50	23.28
RF	610	471.48	138.52	19187.79	40.70 1174.04

From table IV the calculated chi square value was 174.04 at df = 2 while the tabulated values were 5.99 and 9.21 at 0.05 and 0.01 levels of significance respectively. This shows great disparity between observed and predicted frequencies in 1997. The null hypothesis that there was no difference in the performance of the two groups is therefore rejected. There is enough evidence to conclude that there is a difference between the performance of the urban and rural school candidates and that in fact the urban school candidates performed much better than their rural school counterpart in 1997.

Testing of research question III

Table V 1998 observed and predicted frequencies of urban and rural schools in Ebonyi, Anambra and Imo States

School	Alpha	Credit	Fail	Total
	UA	UC	UF	
Urban Fo	313	623	1213	2149
Fp	241.68	531.26	1376.06	
	RA	RC	RF	
Rural Fo	20	109	683	812
Fp	91.32	200.74	519.94	
Total	333	732	1896	2961

Table V shows that out of a total of 2149 urban school students' 313 obtained alpha grades, 623 obtained credit while 1213 failed. In the rural schools out of a total of 742 students 17 obtained alpha grades 115 obtained credit grades while 610 failed.

Table VI calculation of chi square values for table V

Group	Fo	Fp	Fo-Fp	$(Fo-Fp)'^2$	$(Fo-Fp)^{2\,F}$P
UA	313	241.68	71.32	5086.54	21.05
UC	623	531.26	91.74	8416.23	15.84
UF	1213	1376.06	-163.06	26588.56	19.32
RA	20	91.32	-71.32	5086.54	55.70
RC	109	200.74	-91.74	8416.23	41.93
RF	683	519.94	163.06	26,588.56	51.14 1204.98

From table VI the calculated chi square value was 204.98 at df = 2, while the tabulated values were 5.99 and 9.21 at 0.05 and 0.01 levels of significance respectively. This also shows great disparity between the observed and predicted frequencies in 1998. The Ho that there was no difference in the performance of the two groups is therefore rejected. There is enough evidence to conclude that there is a difference between the performance of the urban and rural school candidates. The urban school candidates actually performed much better than their rural school counterpart in 1998.

Testing of research question IV

Table VII combined performance of urban and rural school candidates from 1996-1998.

Year	Calculated chi square value	Tabulated chi square value 5%	Tabulated chi square value 1%	Degree of freedom
1996	542.78	5.99	9.21	2
1997	174.04	5.99	9.21	2
1998	204.98	5.99	9.21	2
1996-1998	921.80	17.97	27.63	6

Influence and Implications of School Location on the Academic Performance of Students in Agricultural Science

The additive property of chi square was used to test the Ho that there was no difference in the performance between urban and rural school counterparts over the 3 years period (1996-1998) combined. This is achieved by the summation of calculated and tabulated chi square value for the different years as well as their corresponding degrees of freedom, -(Spiegel, 1972).

As can be seen from the table the calculated chi square value is far greater than the tabulated values at 5% and 1% levels of significance respectively. Then the null hypothesis that no difference in performance between the two groups of students in the three years combined.

Discussion and Educational Implications

The results of the study clearly showed that urban school candidates were academically far more superior to the rural school candidates over the 3 years in all the states considered. Similar findings were also obtained by Daramola, (1983), Adebayo (2005), Komolafe (2002). That both individually and over the years combined urban school students were higher achievers than rural school students emphasize the fact that something urgent be done to improve the teaching and learning environment of rural school students so as to enhance their academic outcomes.

Poor facilities had been listed as one of the factors that affect performance, (Balogun, 1985). Also urban schools had been found to be better staffed/equipped with amenities and other opportunities (Adebayo, 2005) and teachers with necessary knowledge and equipment will communicate much more effectively with the students and achieve better than ill-equipped students, (Olaitan, 1985). It is therefore imperative that both staffing and equipment in the rural schools be beefed up to meet the provision in the urban areas.

As attitudes correlate highly with scientific achievement (Soyibo, 1989) and urban school students have been known to show more favourable attitude towards science than their rural counterparts (Belogun, 1985) efforts should be stepped up to enhance the attitude of rural school students to agriculture. One of the ways of doing this is to identify practices and experiences which the rural students already possess and then relating these to the agricultural activities the students are to be taught. By so doing the rural students would be able to appreciate the importance of the activities and experiences to be learnt, develop the much-needed interest (Eshiet, 1984) and eventually improve their achievement/performance.

Recommendations

The following recommendations are thereby advocated:

(1) Laboratory spaces should be well equipped while other teaching and learning facilities in the rural schools should be beefed up to the level of their urban counterparts.

(2) Trained and well-qualified teachers with requisite knowledge and skills in agricultural education should be employed and posted to the rural schools. The rural schools environment should be provided with modern amenities such as electricity, pipe borne water, hospitals and good roads to help retain the services of teachers posted to such schools.

(3) The agricultural industries location in the rural areas should be used to advantage by periodically taking these students out on excursions to these places. This would help relate theory to practice as well as greatly improve the attitude of the students toward their subject and also enhance their performances.

Conclusion

Many factors are known to affect educational achievement of students. They include sex, school location and type, teacher qualification and cognitive styles among others. But school environment is by far the greatest contributing factor. The influence of environment (urban or rural) on the academic achievement of agricultural science school certificate students in the years 1996-1998 will be compared in this study. Result collated and analyzed showed that urban school students performances were much better than that of their rural school students in each of the years and over the three years combined. The need for proactive measures to be adopted so as to boost learning outcomes in agricultural science students in the rural schools is hereby advocated.

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