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Full Length Research

Home farm experience and academic performance of senior secondary school students in Agricultural Science in Enugu State, Nigeria

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ABSTRACT: The study sought to determine the relationship between home farming experience and the academic performance of senior secondary school students in Enugu State, Nigeria. The study adopted a correlational research design. The population of the study was 52,787 students in the 285 government secondary schools in the state. The sample size of 396 for the study was estimated using the Taro Yameni formula. The data for the study were collected using two sets of questionnaires comprising the Home Farm Experience Questionnaire (HFEQ) and the Students' Academic Performance Questionnaire (SAPQ). The HFEQ contained 30 items while the SAPQ contained 10 items. The questionnaires consisted of 4-point rating scales of strongly agreed, agreed, disagreed and strongly disagreed with assigned values with weights of 4, 3, 2 and 1 respectively. The instruments were validated by 3 experts in Agricultural Education at Michael Okpara University of Agriculture, Umudike. The reliability of the instruments was 0.78 for HFEQ and 0.75 for SAPQ. The reliability was established through a pilot study on 30 students offering agricultural science in secondary schools in Abia State and the response was analyzed using Cronbach alpha coefficient. Data generated were analyzed using Pearson Product Moment Correlation for the research question and simple regression for testing the null hypotheses. Results showed a very strong relationship between home farm experience in animal production, crop production and soil conservation and the academic performance of agricultural science students in senior secondary schools in Enugu State. It was recommended that the state government through her Ministry of Agriculture should empower families with inputs to encourage them in their homestead farming since it has been revealed that it enhanced students' performance in agricultural science.

Keywords: Academic performance, Agricultural Science and Home farming experience,

INTRODUCTION

The origin of agriculture dates back to the activities of the early men who were wanderers in search of food. According to Habib (2013), the activities of these early men ranged from picking natural fruits and capturing wild animals which coincidentally metamorphosed into the current organized farming operations fused into a formal school system as a course of study. Today, farming activities are done at various scales ranging from commercial scale through subsistence to family size home-stead farming in many homes.

Home farming is the growing of crops and rearing of animals within the farmer's residential home Mustapha and Jimoh (2012) defined home farming as the process of engaging in small-scale production of food with the goal of being self-sufficient, or at least limiting their reliance on outside sources. Although homesteading typically applies to farms, it is also possible to have an urban homestead farming involving the practice of sustainable living techniques, urban agriculture and a frugal lifestyle. FAO (2021) noted that the most important characteristics of homestead farming are their location adjacent to homes, close association with family activities and a wide diversity of crop and livestock species to meet family needs. They have played a central role in household security for food, fuel, fibre, materials and even land ownership, as people changed from an exclusively hunting and gathering lifestyle and settled in small communities. Homestead farming worldwide typically combines the production of different crops, vegetables and livestock. In the homestead farming system, cropping and grazing areas surround a settlement. Bordering the settlement, there may be large-scale monocultures such as wheat or sugar cane farms; further away there may be forest or other common land used periodically for grazing, hunting and gathering firewood, materials and seasonal forest foods. In the village, the small area surrounding a house provides good conditions for a garden. The village is usually close to a source of water and is usually better protected from floods and foraging animals than other farmland. There is good access by path or road, and it is the family's central living area. A home garden can be defined as a farming system that combines physical, social and economic functions on the area of land around the family home. The area is used as a place of work and for storage and processing of farm produce. It is also a place where people live and dispose of waste.

However, the process of farming at home utilizes family labour including the children and parents. Galhena *et al*. (2013) opined that home farming does not rely on hired labour but rather focuses on the effective participation of every member of the family in working hard to contribute to the family's food security and income generation. Homestead farming has contributed immensely to the social, economic and even environmental and cultural well-being of local communities of the world. Homestead gardens have been identified as a strategy to enhance household food security and nutrition. It is an integral part of local food systems and the agricultural landscape of developing countries all over the world and a tested local strategy that is widely adopted in various areas by local communities with limited resources and institutional support. Homestead gardens are important parts of the local tradition and values in most cultures around the world. Indeed, many benefits are attached to homestead farming including, maintenance of health through physical fitness, increase in local food security, provision of funds for the family and developing children's interest in the study and development of agriculture in schools. The home farming system is among the major factors promoting the growth of agriculture as a discipline or course of study in schools through interest developed by children from their farming experience with parents and siblings.

Homestead farming exposes children to the various production processes of animals and crops including soil conservation techniques using traditional methods. Eze (2013) noted that among the aspects of agriculture that children are exposed to during the homestead farming system include domestic animal production, horticulture and pomology. Olaitan and Mama (2001) affirmed that the home farming system enables family members to gain direct experience in the cultivation of crops and rearing of local farm animals within the residential environment. In rural and semi-urban areas, children are often observed independently keeping local fowls, goats, sheep and raising vegetables within any little space in the family compound. This enables them to gain direct experience in the activities involved in agriculture even before they begin attending school. Experience in homestead farming gained by students and youths prior to schooling or during the schooling period in the context of this study is grouped into crop production, animal production and soil conservation.

In crop production, children gain experience in the farm operations required to keep and maintain a home garden as they carry out these operations with their parents and siblings. These operations include land selection and preparation, tillage, planting with adequate plan spacing and seed depth, weeding using herbicide, fertilizer application or green manuring, watering or irrigation, harvesting and post-harvest operations. In animal production, students engage in activities relating to the selection of healthy and good breeds of farm animals, creep feeding, disease and pest control and so on. Students also gain farming experience in soil conservation measures such as application of common manures resulting from the kitchen and other household wastes, reducing soil acidity through spraying of wood ash on the farm, mulching, fertilizer application and so on. These activities highly influence students' performance in practical, laboratory and class lessons (Cushman *et al*., 2008). Practical skills in animal farming operations acquired at home by the students further increase their interest in agricultural science as a subject and consequently improve their academic performance in schools (Obi, 2020).

Academic performance is the measurement of student achievement across various academic subjects. Teachers and education officials typically measure achievement using classroom performance, graduation rates and results from standardized tests. From a general point of view, academic performance is the extent to which a student, teacher or institution has achieved their short or long-term educational goals. Erum and Ahmed (2011) saw

academic performance as the rate at which the objectives being pursued by the students from the curriculum are being achieved. The authors further stated that student's academic performance and graduation rates have been the area of interest for different educational levels. Academic performance in the context of this study is the measurement of student's achievement in agriculture. This has a lot to do with past or previous experience of the students in farming. Ogbuluijah (2014) found in his study that students who participated in farming activities in their homes and attended field trips on farms had better academic performance in agricultural science. A study carried out by Anderson (2019) found that prior farming experience from homes greatly influenced students' academic performance in vocational agriculture subjects. This experience is gained through engagement in the family farming system. In the opinion of Cushman *et al.* (2008), there is a positive relationship between students off-school experience in soil conservation and their performance in agricultural subjects. More so, Oftsted (2008) maintained that children from farming families performed better than those without any prior knowledge of crop production. Peter (2013) observed that there is a positive relationship between students' farm experience in soil management, maintaining that every aspect of farm operations done at home are also carried out in the schools.

Statement of the problem

Agriculture is a daily task which is carried out by many homes either directly or indirectly. In the formal school system, agriculture is done as an independent discipline due to its role in the daily survival of man. Academic performance in secondary schools is a function of many variables which may range from the individual learner's capacity, the content being delivered, the teacher's quality and past experience of the learners on the context or topic at hand. All the variables above are important factors determining students' academic performance in vocational subjects such as agricultural science. Many students perform well in agricultural science but perform below average in other subjects while others consistently perform poorly in agriculture and above average in other subjects. This situation cuts across urban and rural schools. There is thus no established variable determining students' academic performance in agriculture particularly in the study area. This situation led the researcher to the study in order to examine the relationship between home farm experience and the performance of senior secondary school students in agricultural science.

Purpose of the study

The purpose of the study was to examine the relationship between home farm experience and the academic performance of senior secondary school students in agricultural science in Enugu State Nigeria. Specifically, the study intends to investigate the:

1. relationship between home farming experience in animal production and academic performance of senior secondary school students in agricultural science.
2. relationship between home farming experience in crop production and academic performance of senior secondary school students in agricultural science.
3. relationship between home farming experience in soil conservation and academic performance of senior secondary school students in agricultural science.

Research question

The following research questions were posed for the study.

1. What is the relationship between home farming experience in animal production and the academic performance of senior secondary school students in agricultural science?
2. What is the relationship between home farming experience in crop production and the academic performance of senior secondary school students in agricultural science?
3. What is the relationship between home farming experience in soil conservation and the academic performance of senior secondary school students in agricultural science?

Hypotheses

The following hypotheses stated in null form were tested for the study at a 0.05 level of significance.

H_{01}: There is no significant relationship between home farm experience in animal production and the academic performance of senior secondary school students in agricultural science.
H_{02}: There is no significant relationship between home farm experience in crop production and the academic performance of senior secondary school students in agricultural science.
H_{03}: There is no significant relationship between home farm experience in soil conservation and the academic performance of senior secondary school students in agricultural science.

METHODOLOGY

A correlational research design was adopted because the study focused on identifying the relationship between 2

sets of variables. The area of the study is Enugu State with a focus on students and teachers of agricultural science in senior secondary schools in the area. The population of the study was 52,787 students offering agricultural science in the 285 schools in the state. The sample size for the study was 396 estimated using the Taro Yameni formula for sample size. Furthermore, a multi-stage sampling procedure was adopted to select 396 students from across all the educational zones in the state. Two sets of questionnaires titled Home Farm Experience Questionnaire (HFEQ) and Students' Academic Performance Questionnaire (SAPQ) were the instruments used for data collection. The HFEQ contained 30 items while the SAPQ contained 10 items. The questionnaires consisted of a 4-point rating scale of strongly agreed, agreed, disagreed and strongly disagreed with assigned scores of 4, 3, 2 and 1 respectively. The instruments were validated by 3 experts in Agricultural Education at Michael Okpara University of Agriculture, Umudike. The reliability of the instruments was 0.78 for HFEQ and 0.75 for SAPQ. The reliability was established through a pilot study on 30 students and teachers of agricultural science in Abia State and the response was analyzed using Cronbach alpha coefficient. Data were collected by the researcher and 4 research assistants, 381 copies representing 98% of the instrument distributed were retrieved and analyzed using PPMC for the research question and simple regression for testing hypotheses to ascertain if the level of relationship between each of the independent variables (experience in animal production, crop production and soil conservation) and the dependent variable (academic performance) is significant. For the research question, the decision rule for the interpretation of correlation coefficient (r) value is as follows: ±1.00 Perfect relationship, ±0.70 - 0.99 Strong/ Very high relationships, ±0.60 - 0.69 High relationship, ±0.50- 0.59 Moderate high relationship ±0.30 - 0.499 Weak/Low relationship, ±0.10 - 0.29 Very low relationship and ±0.00 No relationship. For hypotheses testing, the null hypothesis was accepted if the p-value is less than the alpha value of 0.05 and vice versa.

RESULTS

Research question 1: what is the relationship between home farming experience in animal production and the academic performance of senior secondary school students in agricultural science?

The result of the data presented in Table 1 shows a correlation of 0.89. This means that there is a very high and positive correlation between home farming experience in animal production and agricultural science students' academic performance. This implies that increase in home farm experience in animal production would lead to increase in the academic performance of secondary school students in agricultural science.

Research question 2: what is the relationship between home farming experience in crop production and the academic performance of senior secondary school students in agricultural science?

The result of the data presented in Table 2 shows a correlation of 0.88. This means that there is a very high and positive correlation between home farming experience in crop production and agricultural science students' academic performance. This implies that increase in home farm experience in crop production would lead to increase in the academic performance of secondary school students in agricultural science

Research question 3: what is the relationship between home farming experience in soil conservation and the academic performance of senior secondary school students in agricultural science?

The result of the data presented in Table 3 shows a correlation of 0.69. This means that there is a high and positive correlation between home farming experience in soil conservation and agricultural science students' academic performance. This implies that increase in home farm experience in soil conservation would lead to increase in the academic performance of secondary school students in agricultural science.

Hypothesis 1: There is no significant relationship between home farm experience in animal production and the academic performance of senior secondary school students in agricultural science

The result of the data presented in Table 4 shows a p-value of 0.380 and is greater than the alpha value of 0.05 thereby rejecting the tested null hypothesis. This means that there is a significant relationship between home farm experience in animal production and academic performance in agricultural science.

Hypothesis 2: There is no significant relationship between home farm experience in crop production and the academic performance of senior secondary school students in agricultural science

The result of the data presented in Table 5 shows a p-value of 0.403 and is greater than the alpha value of 0.05 thereby rejecting the tested null hypothesis. This means that there is a significant relationship between home farm experience in crop production and the academic performance of senior secondary school students in agricultural science.

Table 1. PPMC result of the relationship between home farming experience in animal production and academic performance of senior secondary school students in agricultural science.

Item	$\bar{X}$	*r*	Relationship
Animal production	2.84	0.89	Very high and positive
Academic performance	3.04		

Table 2. PPMC result of the relationship between home farming experience in crop production and academic performance of senior secondary school students in agricultural science.

Item	$\bar{X}$	*r*	Relationship
Crop production	3.17	0 .88	Very high and positive
Academic performance	3.04		

Table 3. PPMC result of the relationship between home farming experience in soil conservation and academic performance of senior secondary school students in agricultural science.

Item	$\bar{X}$	*r*	Relationship
Soil conservation	2.92	0.69	High and positive
Academic performance	3.04		

Table 4. Linear regression of the relationship between home farm experience in animal production and academic performance of senior secondary school students in agricultural science.

	Sum of squares	Df	Mean square	F	Sig.
Regression	27.200	1	27.200	1229.578	0.380[b]
Residual	7.765	351	0.022		
Total	34.964	352			

a. Dependent Variable: A.P.; b. Predictors: (Constant), H.F.E.

Table 5. Linear regression of the relationship between home farm experience in crop production and academic performance of senior secondary school students in agricultural science.

	Sum of squares	df	Mean square	F	Sig.
Regression	26.696	1	26.696	1029.298	0.403[b]
Residual	9.104	351	0.026		
Total	35.799	352			

a. Dependent Variable: C.P.; b. Predictors: (Constant), H.F.E.

Hypothesis 3: There is no significant relationship between home farm experience in soil conservation and the academic performance of senior secondary school students in agricultural science

The result of the data presented in Table 6 shows a p-value of 0.520 and is greater than the alpha value of 0.05 thereby rejecting the tested null hypothesis. This means that there is a significant relationship between home farm experience in soil conservation and the academic performance of senior secondary school students in agricultural science.

DISCUSSION

The findings of the study in research question 1 show that there is a very strong positive relationship between home

Table 6. Linear regression of the relationship between home farm experience in soil conservation and academic performance of senior secondary school students in agricultural science.

	Sum of squares	Df	Mean square	F	Sig.
Regression	24.863	1	24.863	747.708	0.520[b]
Residual	11.671	351	0.033		
Total	36.534	352			

a. Dependent Variable: S.C.; b. Predictors: (Constant), H.F.E.

farm experience in animal production and the academic performance of students in agricultural science. This finding is in line with Obi (2020) who found that practical skills in animal farming operations acquired at home by the students further increase their interest in agricultural science as a subject and consequently improve their academic performance in schools.

The findings of the study in research question 2 show that there is a strong positive relationship between home farm experience in crop production and the academic performance of students in agricultural science. This finding is in tandem with Oftsted (2008) who found that children from farming families performed better than those without any prior knowledge of crop production.

The findings of the study in research question 3 reveal that there is a positive relationship between home farm experience in soil conservation and the academic performance of students in agricultural science. This finding agrees with Cushman *et al*. (2008) who noted that there is a positive relationship between students' off-school experience in soil conservation and their performance in agricultural subjects. More so, Peter (2013) observed in line with the findings of this study that there is a positive relationship between students' farm experience in soil management and maintenance and that every aspect of farm operation done at home is also carried out in the schools.

Conclusion

Based on the findings of this study, it could be concluded that there is a very strong positive relationship between home farm experience and the academic performance of agricultural science students in senior secondary schools in Enugu State. This implies that generally, increase in home farm experience would lead to increase in the academic performance of secondary school students in agricultural science.

Recommendations

Based on the findings of the study, the following recommendations were made:

1. The government through her Ministry of Agriculture should empower families with inputs to encourage them in their homestead farming since it has been revealed that they enhance students' performance in school.
2. Parents should always carry their children along in their farming operations so they can develop more interest in agriculture.
3. Students should endeavour to take active part in home farming while relating the experience to school academic activities.

CONFLICT OF INTEREST

The authors declare that they have no conflict of interest.

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