

Influence of Family Characteristics on Academic Performance of Students in Secondary Agriculture, in Rachuonyo North Sub County, Kenya

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Abstract

A high number of students in Rachuonyo North Sub County, Kenya continue to perform poorly in the Kenya Certificate Secondary Examinations (KCSE), the national examination. The performance continues to show downward trend particularly in the Agriculture Subject. There are many interacting factors likely to cause the poor performance of students in Rachuonyo, socio-economic status of the parents being one of the factors. Socio-economic status of the parents is usually linked to the family's income, parents' educational level and family size among the kith's and kin. In the study, these factors were referred to as family characteristics. The objective of the study was to determine the influence of family characteristics (family income, family size and family level of education) on the students' academic performance in Agriculture Subject. Co-relational design was used during the study and stratified sampling was used to select schools for the study. The target population for the study was students taking Agriculture Subject. There were 754 students taking Agriculture Subject at Form Four. Stratified random sampling was used to select the sample for the study. The sample size was 254 students taking Agriculture Subject. The items of the questionnaire were developed based the objectives of the study. The items of the questionnaire were discussed with other experts for their validity. The instrument was pilot tested to ascertain for its reliability. The reliability coefficient α was 0.72. The instrument was self administered. Data was analyzed using both descriptive statistics (frequencies, percentages, means and standard deviation) and inferential statistics (Pearson correlation and multiple regressions) were used for statistical tests with levels of significance set at 0.05 alpha. Statistical Package for Social Sciences software (SPSS) was used for data analysis. The study found a positive correlation between level of education of the mother and students' performance. Furthermore, multiple regression results on family characteristics found no significant influence of family characteristics on students' performance in secondary school agriculture in Rachuonyo North District, thus the hypothesis was accepted.

Key words: Family characteristics, Agriculture Subject, Performance, Kenya Certificate Secondary Examinations

Introduction

A high number of students in Rachuonyo North Sub County, Kenya continue to perform poorly in the Kenya Certificate Secondary Examinations (KCSE), the national examination. The performance continues to show downward trend particularly in the Agriculture Subject. There are many interacting factors likely to cause the poor performance of students in Rachuonyo, socio-economic status of the parents being one of the factors. Socio-economic status of a family is usually linked with the family's income, parents' educational level, parents' occupation and family size among the kith's and kin. Ford and Harris (1997) followed this logic while examining parental influences on African American students' school achievement by focusing on specific socio-demographic factors, including parents' level of education, marital status, and family income. The researchers observed that children from high and middle socio-economic status, parents are better exposed to a learning environment at home because of provision and availability of extra learning facilities. While investigating the determinants of international students' academic performance, Jing-Lin (2009) compared performance between Chinese and other international students. The results found that the perceived importance of learning success to family, English writing ability and social communication with their compatriots were significant predictors for all international students. Akanle (2007) studied socio-economic factors influencing students' academic performance in Nigeria, he found that insufficient parental income, family type and lack of funding by governments were factors influencing students' academic performance. The achievement of students was negatively correlated with the low socio-economics status level of parents because it hindered the individual in gaining access to sources and resources of learning (Eamon, 2005). Checchi (2000) study concluded that family income provides an incentive for better student performance; richer parents internalize this effect by investing more resources in the education of their children.

A study by African Population Health and Research Centre in Kenya, observed that performance of pupils in reading and mathematics was largely influenced by the socio-economic background of their parents, where they live, and whether or not they aspire to go to University, Aduda (2010). However, Hijazi and Naqvi (2006) found that there was a negative relationship between student performance and student family income. Similarly, Beblo and Lauer (2004) found that parent's income and their labour market status have a weak impact on children's education.

Parental education is the other socio-economic factor likely to influence academic performance of their children. A study by Phillips (1998) found that parental education and socio-economic status have an impact on student achievement, thus, students with both parents having college education tended to achieve at the highest levels. Supporting this finding, Krashen (2005) concluded that students whose parents were educated scored higher on standardized tests than those whose parents were not educated. According to Ermisch and Francesconi (2001), there was significant gradient between each parent's educational level and their child's educational attainment.

In the study area, (Rachuonyo North Sub County) students come from different family backgrounds with different family characteristics. Learning outcomes are influenced by various factors, family characteristics among them which constituted independent variables. The variables investigated under family characteristics included, family income, family size and family level of education. Academic performance in Agriculture Subject in the Kenya Certificate Secondary Examinations constituted the dependant variables.

Location of the Study

The study was done in Rachuonyo North Sub County, Homa Bay County, Kenya. The sub county is approximately 90 kilometres to Kisumu city and about 500 kilometres to Nairobi city. The sub county has an area of about 438 square kilometres. The sub county is characterized by inadequate and erratic rainfall. Access to services like education, health communication are poor which could have contributed to poor academic performance among other factors in the study area. The Sub County was chosen for the study because the researcher is knowledgeable about the area. It was important to understand factors influence poor academic performance of students in order to seek practical ways for the forward for the improvement of performance in Agriculture Subject in KCSE.

Methodology

The study used co-relational research design to get students opinions on the family related variables, as well as to determine the degree of association between performances in agriculture by secondary school students. Co-relational study involves collection of two or more sets of data from a group of subjects in order to determine the subsequent relationship between the two sets of data (Kathuri & Pals, 1993)

The target population consisted of Agricultural Teachers and Form Four Students taking Agriculture Subject as an examinable subject in the Kenya Certificate Secondary Examination (KCSE) in Rachuonyo North Sub County. Rachuonyo North Sub County has 38 secondary schools, consequently, there were 38 Agriculture Teachers with a total population of 754 students taking agriculture (District Education Office Records, 2012). Thus the population of the study was 38 Agriculture Teachers and 754 Students taking Agriculture subject at Form Four.

Stratified sampling was used to select schools for the study. Geographical location of schools within the Sub county was used as the criteria for stratification. Mugenda and Mugenda (2003) noted that the goal of the stratified random sampling is to achieve the desired representation from various sub groups in the population. Krejcie and Morgan (1970) indicate, from a finite population of 750, a sample size of 254 would be appropriate. Borg and Gall (1993) suggest a minimum of 30 cases for co-relational research and therefore for the the schools, the required critical mass was 30 secondary schools. Thus 254 form Four Agriculture student 30 Agriculture Teachers constituted the sample for the study. Selection of specific schools from each geographical area was done through stratified random sampling. The unit of sampling was secondary school rather than

individual students because secondary schools operate as an intact group (Borg & Gall, 1989). This means, therefore, that each school was considered as one group. The 254 students were divided by 30 schools participating in the study to give about 9 Form Four students per school assuming that the numbers of Form Fours were equally distributed in the schools within the District.

The instruments for data collection were carefully designed. Data on the dependent variable was the scores on the agriculture Mock examination taken by all agriculture students during Rachuonyo District Mock Examination. Researchers developed a questionnaire that was administered to Form Four agriculture students to collect data on family characteristics. The instrument was given to experts for validation. The questionnaire was pilot tested using schools in a Division that was not included in the study but had similar characteristics as the sample schools to ascertain the reliability of the instrument. The reliability coefficient was estimated using split half method that yielded a reliability coefficient of 0.72.

The researchers visited the sampled schools to administer the questionnaire to agriculture students in all the sampled schools. Filled questionnaires were consequently collected from the students by the researchers. The collected data relating to family income, family size and family level of education were sorted through cleaning and coding and then organized for easy analysis. Qualitative and Quantitative methods of data analysis were used with both descriptive as well as inferential statistics being applied to explain the results of the study. Using descriptive statistics helped the researchers to describe the population of study, while inferential statistics helped the researchers to make inferences about the population based on the results of a representative sample (Mugenda & Mugenda, 2003). The types of descriptive statistics used included frequencies, percentages, means, as well as, standard deviations while inferential statistics used included Pearson correlation and multiple regression analysis. The Alpha level was set at 0.05. The statistical package for social sciences was used in the data analysis.

Results and Discussions

Family characteristics and academic performance

The study investigated the influence of family income, family size and parents education on academic performance in Agriculture Subject.

Influence of family income on the students' academic performance in Agriculture Subject

The study found that 42.5% of the students come from families which earned between Kenya Shillings between 00 – 2000 per month, while only 0.4% of the families earned over Kenya Shillings 50,001 (Table 1). In this study, it is evident that most parents from this district were generally poor. In spite of this, low family earnings did not influence performance of students in agriculture negatively, since, students coming from families with the lowest monthly income had higher mean score (49.7083) as compared to students coming from families with the highest monthly income (Table 2).

Table 1: Family income in Rachuonyo North District

Income (Kenya Shillings)	Frequency	Percent
00- 2000	108	42.5
2001-5000	72	28.3
5001-10000	30	11.8
10001- 15000	15	5.9
15001- 20000	15	5.9
20001- 50000	13	5.1
Over 50001	1	0.4
Total	254	100

Table 2: Comparing Family's Monthly Income and Performance in 2012 Mock Examination

Income (Kenya Shillings)	Mean	N	Std. Deviation
00- 2000	48.3056	108	13.75585
2001-5000	49.7083	72	14.65513
5001-10000	46.6667	30	13.61625
10001- 15000	45.0000	15	16.06682
15001- 20000	45.2667	15	22.03720
20001- 50000	45.1538	13	11.71072
Over 50000	29.0000	1	.
Total	47.8976	254	14.59809

Influence of family size on the students' academic performance in Agriculture Subject

The study observed that 37.8% of the students come from families with 5-8 dependants while 36.2% of the students came from families with 9-12 dependants (Table 3). The study established that students coming from smaller family size had a higher mean score (54.3500) as compared to students coming from larger family size (Table 4).

Table 3: Family Size of the Respondent Students

Family Size	Frequency	Percent
1-4	21	8.3
5-8	96	37.8
9-12	92	36.2
13-16	24	9.4
17-20	11	4.3
21-24	5	2
25-28	3	1.2
Over 28	2	0.8
Total	254	100

Table 4: Comparing Family's Size and Performance in 2012 Mock Examination

Family's Size	Mean	N	Std. Deviation
1-4	54.3500	20	16.70573
5-8	47.6316	95	15.32003
9 – 12	46.8925	93	12.72746
13 – 16	47.5600	26	15.75881
17 – 20	49.3636	11	18.40257
21 – 24	53.2000	5	12.13260
25 – 28	36.5000	2	10.60660
Over 28	42.0000	2	8.48528
Total	47.9368	254	14.61367

Influence of family level of education on the students' academic performance in agriculture

The study established that 35.4% of student's fathers had secondary school education while 25.6% of the respondents fathers had attained college education and 28% of the respondents' fathers had primary education while 4.7% had no formal education as compared to 6.3% who had attained a university level of education (Table 5). The study found that students whose fathers had no formal education had a higher mean score (52.1667) compared to students whose parents had university education (Table 6).

Table 5: Level of Education of the Respondents' Father

Education Level	Frequency	Percent
No formal education	12	4.7
Primary level	71	28
Secondary level	90	35.4
College	65	25.6
University	16	6.3
Total	254	100

Table 6: Comparing Father's Education Level and Performance in 2012 Mock Examination

Father's Education Level	Mean	N	Std. Deviation
No formal education	52.1667	12	16.19109
Primary level	49.9155	71	14.25557
Secondary level	48.3889	90	14.33601
College	45.5538	65	14.04906
University	42.5000	16	17.37815
Total	47.8976	254	14.59809

In this study, 41.7% of the students' mother's had primary education, while, 32.3% had secondary education, compared to 14.2% that had college education, whereas, 7.5% had no formal education,

and 4.3% had university of education (Table 7). The study observed that students whose mothers had no formal education had higher mean score (53.8947) compared to students whose mothers had attained university education (Table 8).

Table 7: Level of Education of the Respondent's Mother

Education Level	Frequency	Percent
No formal education	19	7.5
Primary level	106	41.7
Secondary level	82	32.3
College	36	14.2
University	11	4.3
Total	254	100

Table 8: Comparing Mother's Education Level and Performance in 2012 Mock Examination

Mother's Education Level	Mean	N	Std. Deviation
No formal education	53.8947	19	15.12134
Primary level	48.6792	106	13.75815
Secondary level	45.5244	82	14.68116
College	48.5000	36	15.86461
University	45.7273	11	15.43432
Total	47.8976	254	14.59809

Hypothesis Testing

Family characteristics have no statistically significant influence on students' academic performance in agriculture

A positive correlation of 0.56 between family sizes with performance of the students was established suggesting that the high the number of people the better the performance in agriculture (Table 9).

Table 9: Correlations between Performance and Family Size

		Family Size	Marks in Percentage
Family Size	Pearson Correlation	1	-.037
	Sig. (2-tailed)	.	.560
	N	253	253
Marks in Percentage	Pearson Correlation	-.037	1
	Sig. (2-tailed)	.560	.
	N	253	254

Similarly, a correlation was done between level of education of the mother and students' performance; it was found that there was a weak positive correlation with a correlation r value of 0.131. It thus seems that as the level of education of the mother increases, there is a slight increase in performance by the student (Table 10).

Table 10: Correlations between Level of Education of the Mother and the Performance of the Students in 2012 Agriculture Mock Examination in Rachuoonyo North District

		Marks in Percentage	Mother's Education
Marks in Percentage	Pearson Correlation	1	-.095
	Sig. (2-tailed)	.	.131
	N	254	254
Mother's Education	Pearson Correlation	-.095	1
	Sig. (2-tailed)	.131	.
	N	254	254

When multiple regression was done, it was found that the family characteristics did not have significant influence in performance in secondary school agriculture as none of the independent variables when regressed with a dependant variable (performance in agriculture) had a significance value less than 0.05 (Table 11), the only one that seems to be close to a significance of 0.05 was the family size, with a significance of 0.054 and a t -value of -1.941, meaning the larger the family size, the lower the performance of students in agriculture.

Table 11: Regression Coefficients on Family Characteristics
Coefficients^a

Model		Unstandardized Coefficients		Standardized Coefficients		95.0% Confidence Interval for B		
		B	Std. Error	Beta	T	Sig.	Lower Bound	Upper Bound
1	(Constant)	58.601	5.077		11.542	.000	48.555	68.647
	Family Size	-1.784	.919	-.166	-1.941	.054	-3.602	.034
	Father's Education	-3.396	1.869	-.239	-1.817	.072	-7.093	.302
	Mother's Education	.414	2.020	.027	.205	.838	-3.583	4.411
	Family's Income	-.829	.875	-.086	-.948	.345	-2.560	.902

a. Dependent Variable: marks in Percentage

Discussions

Influence of family Characteristics on the students' academic performance in agriculture

The study found that 42.5% of the students come from families which earned between Kenya Shillings between 00 – 2000 per month, in this study, it is evident that most parents from this district were poor, however, this scenario did not influence students' performance in agriculture negatively, since, students coming from families with the lowest monthly income had higher mean score as compared to students coming from families with the highest monthly income. The finding of the study is consistent to Smith, Schneider, and Ruck, (2005) that found that socio-demographic variables do not fully account for the academic successes or failure of minority students. However, Garzon, (2006) and Kirkup, (2008), observed that students with high level of Socio-Economic Status perform better than the middle class students and the middle class students perform better than the students with low level of Socio-Economic Status. However, the achievement of students was negatively correlated with the low Socio-Economic Status level of parents because it hindered the individual in gaining access to sources and resources of learning (Eamon, 2005).

It was quite evident from the study that students coming from smaller family size had a higher mean score as compared to students coming from larger family size. Thus, it was observed that the District had larger family size making the families to apportion little resources to different competing interests such as basic human needs, as well as, education and this influences students' performance in schools. However, this study contradicts a study on family size and academic achievement of children that found a negative relationship between family size of children and their academic achievement, Cherian (1990). Similarly, Poonam and Balda (2001) study found that, family size was negatively correlated with IQ of children. The result implies that children from small size families compared to larger families are academically good. However, Devi and Kiran (2002) reported that large family size, low educational status of parents, low parental involvement and low parental encouragement were found to be the major family factors associated with scholastic backwardness on a study on family factors associated with scholastic backwardness of secondary school children in Hyderabad city.

The results of a correlation between family size and students' performance found a low positive correlation of 0.56 meaning that the high the number of people the better the students' performance in agriculture. This can be attributed to the fact that there could be a likelihood of many people in a household getting involved in agricultural activities to supplement their livelihood and therefore making such a student to have a positive attitude towards agriculture. This finding is contrary to the findings of Poonam and Balda (2001) that reported that, family size was negatively correlated with IQ of children. The result implies that children from small size families compared to larger families are academically good.

According to the study, students whose fathers had no formal education had a higher mean score compared to students whose parents had university education. Similarly, the study further observed that students whose mothers had no formal education had higher mean score compared to students whose mothers had attained university education. This therefore, implies that fathers and mothers

'education had little influence on students' performance. This finding is contrary to the study done by Phillips (1998) that found that parental education and socio-economic status have an impact on student achievement, thus, students with both parents having college education tended to achieve at the highest levels. Similarly, Krashen (2005) in another study concluded that students whose parents were educated scored higher on standardized tests than those whose parents were not educated.

Correlation results between level of education of the mother and students performance, yielded a weak positive correlation with a correlation r value of 0.131. It thus seems that as the level of education of the mother increases, there is a slight increase in performance by the student. This result was supported by Agus and Makhbul (2002) that found that the level of education of the mother has been found to exert the strongest influence on academic achievement as compared to level of education of the father. Multiple regression results found that family characteristics did not have significant influence on students' performance in secondary school agriculture as none of the independent variables when regressed with a dependant variable had a significance value less than 0.05, the only one that seems to be close to a significance of 0.05 was the family size, with a significance of 0.54 and a t -value of -1.941, meaning the larger the family size, the lower the performance of students in agriculture. All the t -values on family characteristics were all less than 1.96 and the significance were all greater than 0.05 implying that family characteristics considered were not a significant predictor of students' performance in agriculture. Thus the hypothesis was accepted.

Conclusions

- Large family size was found to lower performance of students.
- There is a positive correlation between level of education of the parents, mother in particular and the children' (students') performance.
- Further, the study observed that parental low levels of education positively influenced students' performance. However, the results indicated that family characteristics had no significant influence on students' academic performance in agriculture in Rachuonyo Sub County.

Recommendations

Family size had an influence on the performance of the students in examinations; large family size was found to lower performance of students. Ironically in most rural settings in the country (Kenya), Rachuonyo included, large families are relatively associated with high social status. Thus, sensitization and conscious raising programmes ought to be put in place at community level. Programmes such as family planning educational campaigns could be redesigned considered for rural families like Rachuonyo to make more families appreciate the value to have small family size for better welfare of their children which could lead to better performance of students in schools.

and therefore the policy formulators and implementers especially in the developing world should strengthen family planning educational campaigns to rural families like Rachuonyo to make more families appreciate the value to have small family size for better welfare of their children which could lead to better performance of students in schools.

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