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

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Abstract
Over the years, students in Rachuonyo North Sub County have continued to perform poorly in the national examination, Kenya Certificate of Secondary Education Examinations (KCSE).This worrying trend is manifested particularly in the Agriculture Subject. It has been documented that many interacting factors may cause the poor performance of students in Rachuonyo, students characteristics such as students age, student career choice, gender, study times and class attendance being among the factors. In this study, these factors were referred to as students' characteristics. The objective of this study was to determine the influence of students' characteristics (student career choice, gender, study times and class attendance) 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 was 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 registered in Agriculture Subject. The items of the questionnaire were developed based on the objectives of the study and the items were discussed with other experts and then pilot tested to ascertain their reliability. The reliability coefficient α was 0.72. The instrument was self-administered. Data was analyzed using qualitative and quantitative methods where descriptive statistics including frequencies, percentages, means, as well as, standard deviation were used, while inferential statistics included Pearson correlation and T-test were used to test the hypothesis, with levels of significance set at 0.05. Statistical Package for Social Sciences software was used for data analysis.The study observed that students' age, career choice, gender, study times and class attendance positively influenced students' performance in secondary school agriculture. However, tests for statistical significance concluded that students' characteristics considered did not have significant influence on students' academic performance in Agriculture Subject.

Keywords**:** Students Characteristics, Kenya Certificate of Secondary Education Examinations, Agriculture Subject, Performance,

Introduction

There has been a worrying trend over the years that students in Rachuonyo North Sub County have continued to perform poorly in the national examination, Kenya Certificate of Secondary Education (KCSE). This downward trend is manifested particularly in the Agriculture Subject. Learning outcomes are influenced by many factors and therefore, many interacting factors such as social and economic factors may cause the poor performance of students in Rachuonyo North Sub County. Students' characteristics such as student age, career choice, gender, study times and class attendance being among the factors that formed the basis of this study. Studies by Entwisle (1986) and Goldberg (1994) found that most science students begin their career with a desire to learn and with an intrinsic approach to achievement, which later switches to a more extrinsic orientation as students increase in age. This scenario was reported by Richardson (1994) who concluded that mature students were rather more likely than younger students to adopt a deep approach or a meaning orientation towards their academic work, and was conversely less likely than younger students to adopt a surface approach or a reproducing orientation. According to Herr and Cramer, (1996), the level of career aspiration usually affects curriculum choice hence career choice. At the same time, career aspirations are influenced by numerous factors including gender, race, parental support, academic achievement, socioeconomic status, and self-esteem.

Young and Fraser (1994) conducted a study on gender differences in science achievement, and the relative contribution of schools to student achievement was examined; and school level differences were found to contribute significantly toward explaining variations in student performance. Although statistically significant sex differences on performance were found in physics achievement for 10-year old, 14-year old and 12 year old students. School effects were much more powerful in explaining student differences when compared with gender. In addition, Ahmed (1998) also reported that the influence of gender on achievement motivation was found to be non-significant. Chambers and Schreiber (2004) study found that girls showed better performance than boys in certain instances. In addition, gender, ethnicity, and father's occupation were found to be significant contributors to student achievement (McCoy, 2005).

In another study by Al-Hilawani and Sartawi (1997), it was also found that good study skills and habits are fundamental for student's academic performance. Concerning study time, Saxena (1988) reported that study times were positively related to achievement in all the streams of the study (Math, Biology, Commerce and Arts). Better study times characterized the over-achieving group, implying that higher achievement required a systematic and planned approach to preparing lessons, a proper distribution of time, careful attention in the classroom, taking of meaningful notes and formation of expressive answers. In general over achievers are those who had better study times. However, in a study, Beedawat (1984) reported that poor and bad study times were not solely responsible for under achievement.

Many researchers recognized that class attendance is an important aspect in improving student's performance, (for example, Collett; 2007 & Chow, 2003), found that attendance has small, but statistically significant, effect on student performance. Similarly, Marburger (2001) concluded that students who were absent on a given date were significantly more likely to respond incorrectly to questions relating to material covered that day than present students. On the same note, Moore (2006) on his study on how student's attitudes about class attendance relate to their performance in introductory science classes indicated that class attendance enhances learning, on average; students

who attended most classes made the highest grades, despite the fact that they received no points for coming to class. In another study, Arulampalam (2007) found that there is a causal effect between student absence and performance with missing class leading to poorer performance. On the other hand, Martins and Walker (2006) found no significant effects from class attendance.

In Rachuonyo North Sub County, students come from different social and economic backgrounds. Learning outcomes are influenced by various factors. Students' characteristics among them constituted independent variables. The variables investigated under students characteristics included, students' age, career choice, gender, study times and class attendance. Academic performance in Agriculture Subject in the Kenya Certificate of Secondary Education Examinations constituted the dependent variables.

Location of the Study

This study was done in Rachuonyo North Sub County, Homa Bay County, Kenya, which is about 500 kilometres west of Nairobi City and has an area of about 438 square kilometres. The Sub County is characterized by inadequate and erratic rainfall. Access to services such as education, health and communication are poor, and therefore, could have contributed to poor academic performance among other factors in the study area. The Sub County was chosen for the study because the researchers were knowledgeable about the area. It is imperative to understand the factors that determine poor academic performance of students in order to seek practical ways of supporting the students to improve in their performance in Agriculture Subject in the Kenya Certificate of Secondary Education (KCSE).

Methodology

The study used co-relational design to get students opinions on the students' related variables, as well as to determine the degree of association between performances in agriculture by secondary school students. In this case, the influence of the independent variables on the dependent variable shall have taken place without the researchers' manipulation. 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 Form Four students taking Agriculture Subject as an examinable subject in the Kenya Certificate of Secondary Education Examination (KCSE) in Rachuonyo North Sub County. The County has 38 secondary schools with a population of 754 students taking agriculture (District Education Office Records, 2012). Thus the population of the study was 754 students registered in Agriculture subject at Form Four.

Stratified sampling was used to select schools for the study and 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) suggested a minimum of 30 cases for co- relational research and therefore, for the schools, the required critical mass was 30 secondary schools. Thus, 254 Form Four agriculture students constituted the sample for the study. Selection of specific schools from each division 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 Sub County.

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 students' characteristics. The instrument was given to experts for validation. The questionnaire was pilot tested using a school 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 students career choice, gender, study times and class attendance 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

Students' Characteristics and their Academic Performance in Agriculture

The study investigated the influence of students' age, career choice, gender, study times and class attendance on academic performance in Agriculture Subject.

Influence of students age on the students' academic performance in agriculture

The study found that most of the respondents were 18years old (47.6%) while 22.6% were 17years old and 12.2% were 19 years old (Table1).

Table 1: Students Age

Age	Frequency	Percent
14	1	0.4
15	2	0.8
16	16	6.3
17	57	22.4
18	121	47.6
19	31	12.2
20	17	6.7
21	7	2.8
24	1	0.4
25	1	0.4
Total	**254**	**100**

Influence of students career choice on the students' academic performance in agriculture

The study observed that majority of the students (49.6%) would wish to pursue agriculture related careers while 21.3% would wish to pursue engineering related careers and 14.9% would wish to pursue careers in medicine (Table 2).

Table 2:Career Choice of the Student Respondents

Career Choice	Frequency	Percent
Agriculture related	126	49.6
Engineering related	54	21.3
Medical related	38	14.9
Business related	13	5.1
Teaching related	18	7.1
Others	5	2.0
Total	**254**	**100**

Table 3:Career Choice and Performance of Students in 2012 Agriculture Mock Examination in Rachuonyo North District

Career to pursue in future	Mean	N	Standard Deviation
Agriculture related	51.25	116	15.41
Engineering related	47.83	62	13.34
Medical related	50.13	44	16.48
Business related	38.50	12	10.79
Teaching related	46.50	20	16.54
Total	**49.24**	**254**	**15.20**

Comparison between students' performance in agriculture mock examination and career choice revealed that the students who prefer a future career in agriculture related disciplines had a higher mean (51.25) followed by those who indicated they would prefer medical related careers (50.13) as compared to those who indicated that they would wish to pursue engineering, teaching and business career (Table 3).Thus it does seem in this study that the choice of the career one prefers to pursue in future does influence performance.

Influence of students gender on the students' academic performance in agriculture

The study found that the population of male students were (62.6%) compared to female students 37.4% who registered for Agriculture Subject at Form Four (Table 4).

Table 4:Gender of the Student Respondents

Gender	Frequency	Percent
Male	159	62.6
Female	95	37.4
Total	**254**	**100**

Table 5:Mean Performance of Students per Gender in 2012 Rachuonyo North District Agriculture Mock Examination

Gender of the respondent	Mean	N	Std. Deviation
Male	47.6541	159	15.06105
Female	48.3053	95	13.85723
Total	**47.8976**	**254**	**14.59809**

A comparison between performance and gender of the student revealed that female students had a slightly higher mean of (48.30) compared to performance of male student's which had a mean of (47.65) in Rachuonyo North District (Table 5). This means that girls slightly perform better than boys and this may be attributed partly to female students being more conscientious and thus less likely to miss classes. In this study, students' gender seems to be influencing academic performance of students in agriculture.

Influence of students preferred study times on the students' academic performance in agriculture

The respondents chose several options when they preferred to study. Majority (20.4%) indicated they prefer to study at class time and prep time, while the least preferred option was at dawn and during holiday (Table 6).

Table 6: Preferred Study Times of the Student Respondents

Study Times	Frequency	Percent
Class time	9	3.5
Prep time, Dawn time, at home, and holidays	26	10.2
All the five options	42	16.5
Dawn and during holidays	6	2.4
Preps time	12	4.7
Dawn Time	8	3.1
Class time, Preps time, at home and during holidays	28	11.4
Class time , Preps time and During holidays	15	5.9
Class time, and prep time	19	7.5
Class time and dawn time	10	3.9
Prep time and dawn time	26	10.2
Class time, prep time and dawn time	52	20.4
Total	**254**	**100**

Table 7: Preferred Study Times and Performance in 2012 Agriculture Mock Examination in Rachuonyo North District

Study Times of the Respondent	Mean	N	Standard Deviation
Class time	44.0000	9	13.21930
Prep time, Dawn time, at home, during holidays	42.6923	26	12.88959
All the five options	48.9762	42	13.93975
Dawn and during holidays	51.5000	6	10.98636
Preps time	47.9167	12	15.81402
Dawn Time	50.1250	8	13.11964
Class time, Preps time, at home and holidays	50.5862	29	15.87792
Class time , Preps time and during holidays	40.9333	15	14.91627
Class time, and prep time	53.9474	19	12.02531
Class time and dawn time	46.8000	10	18.87267
Prep time and dawn time	47.2692	26	16.19026
Class time, prep time and dawn time	48.3654	52	14.43583
Total	**47.8976**	**254**	**14.59809**

Comparing students' preferred study time and performance in mock examination, Majority (52 respondents) indicated they preferred to study at class time, prep time and dawn time. The group with the highest mean score 53.95 (Table 7) indicated that they preferred to study during class time and preps.

Influence of students class attendance on the students' academic performance in agriculture

The study found that students who did not miss classes had a higher mean score of 48.24, while students who miss classes had a lower mean score of 46.91(Table 8). This means that students who regularly attend classes perform better than those who miss classes. Therefore, it was observed that class attendance influences students' performance in agriculture.

Table 8:Students Responses on Class Attendance Compared to Performance in 2012 Agriculture Mock Examination in Rachuonyo North District

Students missing classes	Mean	N	Standard Deviation
Yes	46.9153	59	13.78816
No	48.2410	166	14.68175
Sometimes	47.9310	29	16.08666
Total	**47.8976**	**254**	**14.59809**

Hypothesis Testing

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

There was a positive correlation between the age of the student and performance with an r value of .249 (Table 9). Thus one can say that the increase in age does cause an improvement in performance in secondary school agriculture.

Table 9:Correlation of Age of Students and Performance in 2012 Mock Agriculture Examination in Rachuonyo North District

		Age	**Marks in Percentage**
Age	Pearson Correlation	1	.073
	Sig. (2-tailed)	.	.249
	N	254	254
Marks in Percentage	Pearson Correlation	.073	1
	Sig. (2-tailed)	.249	.
	N	**254**	**254**

Table 10: Analysis of Variance on Students Age and Students Performance in 2012 Mock Agriculture Examination in Rachuonyo North District

ANOVA[b]

Model		**Sum of Squares**	**Df**	**Mean Squares**	**F**	**Sig.**
1	Regression	284.189	1	284.189	1.335	.249(a)
	Residual	53631.150	252	212.822		
	Total	53915.339	253			

a Predictors: (Constant), Age

b Dependent Variable: Marks in Percentage

Linear regression results on age of the students found that the t-value was 1.156 which was less than 1.96, while the significance was 0.249 (Table 10) which was greater than 0.05.This therefore, means that students age was not a significant predictor of students' performance in agriculture in Agriculture Subject.

Table 11: Regression Coefficients on Age and Students Performance in 2012 Mock Agriculture Examination in Rachuonyo North District

Coefficients[a]

Model		**Unstandardized Coefficients**		**Standardized Coefficients**	**T**	**Sig.**
		B	Std. Error	Beta		
1	(Constant)	32.763	13.129		2.496	.013
	Age	.841	.728	.073	1.156	.249

a Dependent Variable: Marks in Percentage

T-test results found that the difference between the mean of males and females was not significant since the significance value was 0.732 (Table 12) which is greater than 0.05.

Table 12: Independent Samples T-Test Comparing the Means Score of Males and Female Students

		Levene's Test for Equality of Variances		T-test for Equality of Means				
		F	Sig.	T	Df	Sig. (2-tailed)	Mean Diff.	Std. Error Diff.
% mark	Equal variances assumed	1.262	.262	-.343	252	.732	-.6512	1.89632
	Equal variances not assumed			-.351	210.987	.726	-.6512	1.85686

Discussions

Influence of students characteristics on the students' academic performance in agriculture

The study found that most of the students' were 18 years old. This therefore means that, the growth and development of a person has positive influence on a person's mental development, as a result, the performance of students is likely to improve as a student age increases. The study, further observed that majority of the students would wish to pursue agriculture related careers. Furthermore, it was established that the students who preferred a future career in agriculture related disciplines had a higher mean score as compared to other career choices. Thus it does seem in this study that the choice of the career one prefers to pursue in future does influence performance. The level of career aspiration usually affects curriculum choice hence career choice (Herr & Cramer, 1996). Also, career aspirations are influenced by numerous factors including gender, race, parental support, academic achievement, socioeconomic status, and self-esteem.

The study also found that there were more male students than female students. However, the study established that female students slightly performed better as compared to performance of male students. This means that girls slightly perform better than boys and this may be attributed partly to female students being more conscientious and thus less likely to miss classes. In this study, students' gender seems to be influencing academic performance of students in agriculture. This finding is consistent with other studies that found that girls showed better performance than boys in certain instances (Chambers & Schreiber, 2004).

According to the study, students who preferred to study during class time and preps time had the highest mean score as compared to students who chose other options. Thus, it does seem that the students, who take their work seriously during class time and prep time, perform better than those who chose more options. It can also mean that those who only chose class time and prep time to study are brighter than those who have to look for extra time to study and thus their mean score is high. In this study therefore, it seems that study time influences students' performance in agriculture. This finding is similar to the findings of Saxena (1988) that revealed that study habits were positively related to achievement in all the streams of the study (Math, Biology, Commerce and Arts). Better study habits characterized the over-achieving group, implying that higher achievement required a systematic and planned approach to preparing lessons, a proper distribution

of time, careful attention in the classroom, taking of meaningful notes and formation of expressive answers. In general over achievers are those who had better study habits. However, in a study, Beedawat (1984) reported that poor and bad study habits were not solely responsible for under achievement.

On class attendance, the study revealed that students who did not miss classes had a higher mean score as compared to those who sometimes missed classes. This means that students who regularly attend classes perform better than those who miss classes. Therefore, it was observed that class attendance influences students' performance in agriculture. In another study, Romer (1993) reported that the major reasons given by students for non-attendance included assessment pressures, poor delivery of lectures, timing of lectures, and work commitments. However, Durden and Ellis, (1995) controlled for student differences in background, ability and motivation, and reported a nonlinear effect of attendance on learning, that is, a few absences do not lead to poor grades but excessive absenteeism does. The consequences of missing classes have far reaching effects on the students that include increasing probability of dropping out, discouraging hard work, and stressing the students while they are trying to cover missed lessons, hence, increase chances of failing (Mwinzi & Kimengi, 2006).

Linear regression results on age of the students found that the t-value was 1.156 which was less than 1.96, while the significance was 0.249 which was greater than 0.05.This therefore, means that students age was not a significant predictor of students' performance in Agriculture Subject
From the T-test analysis done to find out whether there is any significance difference in the mean performance between male and female respondents, it was found that the difference between the mean of males and females was not significant since the significance value was 0.732 which is greater than 0.05. The study concluded that students' characteristics considered did not have statistically significant influence on students' academic performance in agriculture and therefore, hypothesis was accepted.

Conclusions.

- Students' age was not a significant predictor of students' performance in Agriculture Subject as the linear regression results was not statistically significant.
- Career choice one prefers to pursue in future does influence performance because students who preferred a career in agriculture performed better than students who preferred other career choices.
- Students' gender seems to be influencing academic performance of students in agriculture because the study found that female students slightly performed better as compared to performance of male students. However, T-test found that the difference between the mean of males and females was not statistically significant.
- The study time influenced performance of students because students who preferred to study during class time and preps time had the highest mean score as compared to students who chose other options.
- Students who regularly attend classes perform better than those who miss classes. it was observed that class attendance influences students' performance in agriculture, since the students who did not miss classes had a higher mean score as compared to those who sometimes missed classes.

Recommendation

For optional subjects such as agriculture, schools should have strong inbuilt career guidance so that students choose those optional subjects that match their career objectives. This is evident from the findings that students who have a natural liking for agriculture performed better than those who did not.

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