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RESEARCH ARTICLE

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

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Abstract

This study aimed at finding out the influence of teachers' characteristics on students' academic performance in agriculture. The objective of this study was to determine the influence of teachers' characteristics (training, experience, and teaching method) on the students' academic performance in agriculture. The purpose of this study was to determine how teachers' characteristics influence students' performance in agriculture. Co-relational design was adopted for the study and stratified sampling was used to select schools for the study. The target population was 38 agriculture teachers. The sample size was 30 agriculture teachers who were involved in the study. Data was collected using a questionnaire, for agriculture teachers, as respondents. The instrument was pilot tested to ascertain its reliability and the reliability coefficient was 0.72. Experts ascertained the instruments validity before being used for data collection. Data was analyzed using descriptive statistics including frequencies, percentages, means, as well as, standard deviation, while inferential statistics included Spearman's Rho and simple regression analysis were used to test the hypotheses, with levels of significance set at 0.05. Statistical Package for Social Sciences software was used for data analysis. The results of the study found that teachers' experience had a t-value of 3.172 which was greater than 1.96 with a significance of 0.04, which was statistically significant. The researcher concluded that teachers experience had a statistically significant influence on students' performance in agriculture. Demonstration and field trips methods were found to be effective teaching methods which agriculture teachers should be encouraged to use and should be implemented in all teacher education programmes in Kenya.

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Introduction:-

The development of any nation depends heavily on the provision of quality education to her citizens. It is therefore, imperative that the basis for any true development must commence with the development of human resources (Akanle, 2007), hence, formal education has remained the vehicle for social-economic development and social mobilization in any society. Understanding different parameters that contribute directly to low performance has been a frequent topic, especially in international surveys, for example, the survey carried out by the Organization for Economic Co-operation and Development (OECD) found that 26% of secondary students in Spain (6% above the average of all countries surveyed) did not attain the corresponding diploma (OECD, 2001). However, studies seeking to identify what determine academic failure frequently appeared as a reaction to conditions of change, such as plans for educational reform, or in response to critical situations as indicated by OECD study (2001). A joint study by Harb and El-Shaarawi, (2006) found that a good match between students' learning preferences and instructor's teaching method had positive effect on student's performance. According to Pashler, Mcdaniel, Rohrer, and Bjork, (2008), scholars, who promote the learning preferences approach to learning, agree that effective instruction can only be undertaken if the learner's learning preferences are diagnosed and the instruction is tailored accordingly. Indeed, Omrod (2008) reported that some students seem to learn better when information is presented

through words (verbal learners), whereas others seem to learn better when it is presented in the form of pictures (visual learners). Clearly, in a class where only one instructional method is employed, there is a strong possibility that a number of students will find the learning environment less optimal and this could affect their academic performance (Omrod, 2008). Findings of a study done by KIE (2010) found that although most of the teachers have basic trainings to teach in secondary schools, but they did not have the right competencies to tackle the new revised agriculture syllabus introduced in 2002. This has been worsened by the fact that schools suffer serious teacher shortages and inadequate teaching learning materials, Aduda (2010). Similarly, a research done in the teaching of agriculture by Kibett and Kathuri (2005) observed that students who were taught using project based learning outperformed their counterparts taught using regular teaching approach.

The findings of a study done by Darling – Hammond (2000); Sparks (2000); Osokoya (1999); Sanders and Rivers (1996) found separately that, teacher's training significantly and positively correlated with student learning outcomes in science. Specifically, concerning teacher's training, Darling – Hammond (2000) found that teacher quality characteristics such as certification status and degree in subject to be taught are very significant and positively correlated to subject outcomes in science and mathematics. However, Ingersoll (1999) found in another study that 63% chemistry, physics, earth and space science instructors did not have certification in the subjects and this resulted in the poor performance of students. In addition, Greenwald, Hedges and Laine (1996) asserted that students' achievement was positively correlated with teacher's training. However, Osokoya (1999) found little or no significant relationship between teacher training and achievement. Results of another study, done by Hansen (1988) found that teachers who have spent more time studying and teaching were more effective overall and as a result, teachers developed higher order thinking skills for meeting the needs of diverse students, hence increasing their performance. Likewise, Okoruwa (1999) in another study established that teachers' teaching experience had significant effect on students' achievement in science. In addition, Ijaiya (2000) reported that experience improves teaching skills while pupils learn better at the hands of teachers who have taught them continuously over a period of years. Effective teaching could be measured by the level of a teacher's subject matter competence which Mullens (1993) regarded as a prime predictor of student's learning. The finding of a study by Felder (1993) found that teaching experience as measured by years of service correlated positively with student test results. Findings of Husen, Saha and Noonan (1978) found that student achievements was a good measure of teachers' effectiveness, in which teaching effectiveness was positively related to experience and professional training. Experience enables teachers to be more competent in the mastery of the subject content and delivery. This helps the teacher to positively identify areas of difficulty in the content and adjust appropriately, consequently contributing to improved academic success in secondary agriculture.

Materials and methods:-

Research Design:-

The study used co-relational design to get teachers opinions on the teachers' 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 research design was best for the study because the purpose was to determine whether there was any influence between selected teachers characteristics and academic performance in secondary school agriculture.

Sampling Procedures and Sample Size:-

Stratified sampling was used to select schools for the study. Geographical location 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. The Sub County had a population of 38 secondary schools. The required critical mass was 30 secondary schools which offer agriculture as a subject. This is because Borg and Gall (1993) suggested a minimum of 30 cases for co- relational research. The sample size was 30 agriculture teachers who were selected using stratified random sampling. In stratified sampling, subjects are selected in such a way that the existing sub groups in the population are produced in the sample. The unit of sampling was secondary school rather than individual teachers because secondary schools operate as an intact group (Borg & Gall, 1989). This means, therefore, that each school was considered as one group. One agriculture teacher from each school was selected to participate in the study.

Instrumentation:-

The measurement instrument was carefully designed. Data on the dependent variable (students' academic performance in agriculture) was the mean scores in agriculture subject in KCSE examination between the years 2009-2011. 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 calculated using split half method that yielded a reliability coefficient of 0.72.

Data Collection:-

The researchers visited the sampled schools to administer the questionnaire to agriculture teachers in all the sampled schools. Filled questionnaires were consequently collected from the teachers by the researcher.

Data Analysis:-

The collected data relating to teachers' characteristics (training, experience, and teaching method) were sorted through cleaning and coding and then organized for analysis. Descriptive statistics as well as inferential statistics were used to explain the results of the study. Descriptive statistics helped in describing the population of study, while inferential statistics was used to make inferences about the population based on the results of a representative sample (Mugenda & Mugenda, 2003). The types of descriptive statistics that were used included frequencies, percentages, means, as well as, standard deviations while inferential statistics used included Spearman's Rho and simple regression analysis. The alpha level was set at 0.05. The statistical package for social sciences was used in the data analysis.

Results:-

Influence of Teachers' professional training on the Students' Academic Performance in Agriculture

The results obtained from teachers training indicated that 56.7% teachers had a bachelor's degree in agricultural education, while 36.7% had a diploma as their highest professional qualification (Table 1). This therefore, means that most agriculture teachers were well trained to teach agriculture in the Sub County, the study therefore, found that training seems to have some influence on academic performance of students in agriculture, this is because, students taught by teachers who had master's degree had a higher mean score (6.3200) compared to other training qualifications (Table 2).

Table 1: Highest Professional Training of the Agriculture Teachers

Teacher's Training	Frequency	Percent
Certificate in Agriculture	1	3.3
Diploma Agricultural Education	11	36.7
Bsc. Agricultural Education	17	56.7
Msc. Agricultural Education	1	3.3
Total	30	100

Table 2: Comparing Teacher's Training and KCSE Average Mean Score (2009-2011)

Teacher's Training	Mean KCSE	N	Std. Deviation
Certificate in Agriculture	5.3300	1	.
Diploma Agricultural Education	6.1290	11	.96980
Bsc. Agricultural Education	5.9760	17	1.17714
Msc. Agricultural education	6.3200	1	.
Total	6.0215	30	1.04840

Influence of Teacher's Teaching Experience on the Students' Academic Performance in Agriculture:-

The study established that, 63.3% of the teachers had less than five (5) years' teaching experience while only 3.3% of the teachers had experience of 16-20 years of teaching (Table 3). According to the study, teaching experience was found to influence performance of students because more experienced teachers had a higher mean score (8.5300) in their subjects compared to the least experienced teachers who had a mean score of (5.8707) (Table 4). Experienced teachers may have mastered teaching techniques, subject content and examination techniques compared to teachers who had few years in terms of teaching experience. From the analysis, majority of agriculture teachers had few

teaching years hence less experienced and this may have influenced students' performance in secondary school agriculture.

Table 3: Agriculture Teachers Teaching Experience

Teaching Experience	Frequency	Percent
Less than 5 years	19	63.3
5 -10 years	8	26.7
11- 15 years	2	6.7
16 - 20 years	1	3.3
Total	30	100

Table 4: Comparing Age of the Teacher and KCSE Average Mean Score (2009-2011)

Teacher's Teaching Experience	Mean score KCSE	N	Std. Deviation
Less than 5 years	5.8707	19	1.05925
5 -10 years	6.0744	8	.71974
11- 15 years	5.6600	2	1.34350
16 - 20 years	8.5300	1	.
Total	6.0215	30	1.04840

Influence of Teacher's Teaching Method on the Students' Academic Performance in Agriculture

The study found that demonstration and field trip methods of teaching were preferred by the teachers in the as compared to other teaching methods. This was established when teaching methods were compared to the mean for the schools in past KCSE agriculture examinations from 2009- 2011, that found that demonstration and field trip methods had the highest mean score (6.7) as compared to other teaching methods (Table 5).

Table 5: Teaching Method Compared to Performance of Students in KCSE 2009-2011

N=30

Teaching Method	KCSE 2009-2011 mean	N	Standard Deviation
All methods	6.2233	3	1.16967
Discussion method	6.0600	8	1.05423
Demonstration method and field trip method	6.7000	2	.
Field trip method/demonstration	5.0100	3	.
Project method/demo. Method/discussion method	5.5033	3	1.11096
Lecture/project/discussion	5.8250	2	0.70004
Demo/field trip/discussion method	4.8100	3	.
Lecture/discussion	4.2900	3	.
Lecture /project/field trips/discussion method	6.4000	3	0.74960

Hypothesis Testing

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

Table 6:Correlations between Teachers Experience and Performance in K.C.S.E in Agriculture 2009-2011: Mean Scores

			K.C.S.E 2009-2011	Teaching experience
Spearman's rho	K.C.S.E mean score 2009-2011	Correlation Coefficient	1.000	.160
		Sig. (2-tailed)	.	.424
		N	27	27
	Teaching Experience	Correlation Coefficient	.160	1.000
		Sig. (2-tailed)	.424	.
		N	27	31

A correlation between the number of years of teaching and performance of students in agriculture, gave a rho value of 0.424, meaning that performance seems to improve with increase in the number of years of teaching. Likewise,

linear regression results on teacher's characteristics such as training and teachers experience found that teachers' training did not influence performance in secondary school agriculture, because, the study found t – value of 0.06, which was less than 1.96 while the significance was 0.95 which was above 0.05 (Table 8). However, the t -value for teaching experience was 3.172 (Table 8) which was greater than a critical t - value of 1.96, with a significance value of 0.04, which was less than 0.05 indicating that teachers teaching experience was a significant predictor of students' performance in agriculture in Rachuonyo North Sub County. Thus the hypothesis was rejected because the result on teachers teaching experience was statistically significant.

Table 7: Analysis of Variance (ANOVA) on Teacher Characteristics

Anova ^b						
Model		Sum of Squares	Df	Mean Square	F	Sig.
	Regression	15.737	3	5.246	3.614	.028(a)
	Residual	33.385	23	1.452		
	Total	49.122	26			
A. Predictors: (Constant) Teacher's training, Teachers experience						
B. Dependent Variable: School Mean Score 2009-2011						

Table 8: Regression Coefficients on Teacher Characteristics

Coefficients ^a						
Model		Unstandardized Coefficients		Standardized Coefficients	T	Sig.
		B	Std. Error	Beta		
1	(Constant)	5.421	1.136		4.770	.000
	Teachers Training	.023	.375	.011	.062	.951
	Teachers Experience	1.334	.421	.774	3.172	.004
A. Dependent Variable: Students KCSE Mean Score in Agriculture (2009-2011)						

Discussion:-

Influence of Teachers Characteristics on Academic Performance of Students in Secondary Agriculture:

The results obtained from teachers training indicated that all the teachers in the Sub County had training in agricultural education. The study therefore, found that the level of teacher training seems to have some influence on academic performance of students in secondary school agriculture; this is because, the study revealed that, students taught by teachers who had master's degree had a higher mean score compared to other training qualifications. This finding is consistent with the findings of Darling-Hammond (2000); Sparks (2000); Osokoya (1999); Sanders and Rivers (1996) that separately found that, teacher's training significantly and positively correlated with student learning outcomes in science. Similarly, concerning teacher's training, Darling-Hammond (2000) found that teacher quality characteristics such as certification status and degree in subject to be taught are very significant and positively correlated to subject outcomes in science and mathematics. However, Ingersoll (1999) found in another study that 63% chemistry, physics, earth and space science instructors did not have certification in the subjects and this resulted in the poor performance of students. In addition, Greenwald, Hedges and Laine (1996) asserted that students' achievement was positively correlated with teacher's training. However, Osokoya (1999) found little or no significant relationship between teacher training and achievement.

Teaching experience was found to influence performance of students because more experienced teachers were found to have a higher mean score in their subjects compared to the least experienced teachers. This therefore, means that experienced teachers may have mastered teaching techniques, subject content and examination techniques compared to teachers who had few years in terms of teaching experience. This finding is consistent with another study done by Hansen (1988) that found that teachers who have spent more time studying and teaching were more effective overall and they developed higher order thinking skills for meeting the needs of diverse students, hence, increasing their performance. Likewise, Okoruwa (1999) in another study found that teachers' teaching experience had significant effect on students' achievement in science. In addition, Ijaiya (2000) reported that experience improves teaching skills while pupils learn better at the hands of teachers who have taught them continuously over a period of years.

In this study, demonstration and field trip methods of teaching were preferred by the teachers in the Sub County as compared to other teaching methods. These methods had the highest mean score as compared to other teaching methods. The study therefore, found that teacher's teaching method influenced student's performance. This study is consistent with the study by Harb and El-Shaarawi, (2006) which found that a good match between students' learning preferences and instructor's teaching method had positive effect on student's performance. According to Pashler, Mcdaniel, Rohrer, and Bjork, (2008), scholars, who promote the learning preferences approach to learning, agree that effective instruction can only be undertaken if the learner's learning preferences are diagnosed and the instruction is tailored accordingly.

A correlation between the number of years of teaching and performance of students in agriculture, gave a rho value of 0.424, meaning that performance seems to improve with increase in the number of years of teaching. This finding is similar to the finding of Felder (1993) who found that teaching experience as measured by years of service correlated positively with student test results. However, linear regression on teacher's characteristics such as, training and teachers experience indicated that teachers' training did not influence performance in secondary school agriculture, because the t - value obtained was less than 1.96 while the significance was above 0.05. However, the t-value for teaching experience was 3.172 which was greater than a critical t- value of 1.96, with a significance value of 0.04, which was less than 0.05 indicating that teachers teaching experience was a significant predictor of students' performance in agriculture in Rachuonyo North Sub County. Thus the hypothesis was rejected because the results on teachers teaching experience were statistically significant.

Conclusion:-

Demonstration and field trips methods came out strongly over other methods as the most appropriate method of teaching agriculture. However, the study concluded that teachers experience was a significant predictor of students' performance in agriculture in Rachuonyo North Sub County, because, the result on teachers teaching experience was statistically significant.

Implications of the study:

This study offers evidence that teachers experience and teaching method used by the teachers influence students' performance in agriculture. Since achievement is important in the students learning, teachers should be encouraged to use demonstration and field trips methods to improve performance in agriculture. Since the study found that teachers teaching experience influence students' performance, the Government of Kenya through the policy implementers should ensure that there is a good mix between experienced teachers and inexperienced teachers in all secondary schools to improve students' performance in agriculture.

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