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RESEARCH ARTICLE

The Effect of Teacher Factors on Quality Assessment of Agriculture Projects in Secondary Schools, a case of Kakamega County, Kenya

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Abstract

The assessment of agriculture projects in secondary schools has a lot of disparity in marks awarded by the school and the externally based assessments. There are many factors interacting that are likely to cause the difference, the teacher related factors being one of them. The purpose of the study was to investigate the effect of the teacher factors on the quality of assessment based on the qualification of teachers, teaching experience and integrity of the teachers. The population of the study consisted of 310 teachers of agriculture from 292 public and 14 private secondary schools. Simple random sampling was used to select 109 teachers of agriculture. Structured questionnaires were used to collect data. Results revealed that teacher factors positively and significantly affected the quality assessment of agriculture projects in secondary schools in Kakamega County. Based on the results, the following was the conclusion and subsequent recommendation of the study: Teacher factors, that is, qualifications (academic level), years of experience in teaching and integrity have a positive and significant effect on the quality assessment of agriculture projects. Therefore, for quality of assessment of agriculture projects to be improved in secondary schools, professionally trained teachers of agriculture with experience of teaching should be the only ones to be utilized to assess the projects as these improve the quality assessment of agriculture projects

INTRODUCTION

Global studies show that Educational Assessment in the form of tests and examinations has existed since time immemorial and, in the course of human events; no society has been able to do without some form of test or examination. Examinations are part of human culture, and the advancement of this culture requires the exploitation of examinations to assess the effect of teaching and learning and to distinguish and select talented people (Zhang, 1996). Worldwide, educational assessment in the form of tests and examinations remain the primary factor of access to the institutions of higher learning.

There is a need to examine critically the factors that enhance and ensure quality and uniformity in the assessment of agriculture projects. The challenge arises from the increased number of schools, learners, and limited resources. Project assessment is meant to cater for the inadequacies of assessing affective and psychomotor domains that are very subjective in measurement. In subjects where such school-based assessment does not exist, an examination culture pervades the entire syllabus. Consequently, teachers may not realize the value of such a school-based assessment, particularly if it is not seen as linked to improved performance in public examinations. There is,

therefore, need to research on the factors determining the quality of project work assessment and carefully monitor the gains made so as to ensure it is an authentic assessment (Ingolo and Wasanga, 2001).

The agriculture project work tests the knowledge, attitude and psychomotor skills of students of a given enterprise either in crop or livestock. The teachers of agriculture and external assessors evaluate the projects in the school on behalf of the examination council. The assessment of the agriculture projects poses unique challenges. There have been discrepancies in the assessment of the agriculture projects. Over the years, some of the scores awarded in the school assessment do not correlate well with the score awarded externally. In order to empirically validate the school-based project assessment to enhance its growth, it is important to understand the factors that determine the quality of assessment in agriculture projects in secondary schools. This study, therefore, sought to investigate the factors that determine the quality of assessment of Kenya certificate of secondary school education agriculture projects.

The objective of the study was to determine the effect of the teacher factors on the quality of assessment of agriculture project work based on the qualification of teachers, teaching experience and integrity of the teachers. The study was guided by the following hypothesis that was derived from the objective of the study:

> *There is no statistically significant effect of teacher factors based on qualification of Teachers, experience of teachers and integrity on quality assessment K.C.S.E agriculture Project work.*

This study was based on Achievement-Based Motivational Theory. This theory was developed by Mc Clelland in 1958. Mc Clelland Theory states that human beings are born with the need to achieve (or an-Ach Theory). Kabiru and Njenga (2008) hold the view that the achievement–based motivational theory aims at improving assessment methods, advocating competency-based assessment and tests. This theory seeks for achievement, attainment of realistic but challenging goals and advancement. There is a strong need for feedback on achievement and progress that may satisfy the need for a sense of accomplishment.

Rudman (2000) defines motivation as the psychological process that arouses, directs and maintain behavior towards set goals. In this study, quality assessment in agriculture project work can be realized where all stakeholders are motivated towards achieving better grades in school-based assessment and final examinations.

The teacher plays a noble role in ranking and maintaining interest in students with the desire to venture into agriculture practical work. Teachers help to build self-confidence and high self-esteem among agriculture students as they deal with each task in the project work. Focusing on the theory, the qualified and experienced teachers and other educational assessors become enthusiastic and more interested in their work, when they award genuine marks that are reflected in KCSE results thereafter (KNEC, 2008). Those involved in ensuring better performance in schools, take the lead in encouraging students in agriculture projects to be more critical, creative, and hardworking, develop problem solving skills and excellence to enhance better assessment results (Kabiru and Njenga, 2008).

Diez, (2002) and Rennert-Ariev, (2005) have also added voice that assessment tasks designed for students should be more practical, realistic and, challenging, and that tasks so designed, allow students to showcase their knowledge through hands-on activities and usually take place in more formal setting when learners work in groups. In this way, students interact with their environment as active agents who build or construct a personal understanding of their experience. This is the real aspiration for the assessment of Agriculture as a subject in Kenyan secondary school syllabus (Rudman, 2000).

Raivoce and Pongi (2000) have also indicated that the format of assessment which encompasses the use of psychomotor, affective and cognitive skills of students gives useful feedback about the student's progress and knowledge of the necessary steps to take. Hence, an attempt to incorporate teacher's classroom assessment with project work into a summative assessment is considered to have more merits (Raivoce and Pongi, 2000.)

This study finds value in McMillan, (2000) propositions on assessment thus, assessment of agriculture should be a comprehensive, multifaceted analysis of performance in all domains; and that assessment is an important factor influencing not only the learning process, but the achievement/attainment of intended educational goals. And this is where agriculture project work assessment fits into the relationship. There is the need for a careful examination of

all the interacting factors and interrelationships between educational inputs, assessment and expected educational outputs to achieve the intended goals of education in Kenya.

The Figure 1 summarizes the interrelationship of the interacting factors in the learning process and can be explained as follows: Inputs include the learners and learning resources like textbooks, farm implements, field trips, ASK shows and among others, the teacher contributes to the learning process by imparting knowledge and skills in Agriculture. Assessment – that should assess all the three domains, thus cognitively, affective and psychomotor? The teacher contributes to summative assessment while evaluating project work. Public exams mainly determine the cognitive domain. Outputs — are the agriculture students who have qualified in all the three domains adequately. This may be simply measured by the grade one attains (achieves).

Source: Mc Millan, 2000 Fundamental assessment principles for teachers and school Administrators).

The dependent variable in the study was the quality of assessment of the KCSE agriculture project in Kakamega County. This was measured in terms of very good, good, fair and poor. This was captured by interviewing and administering questionnaires to selected teachers of Agriculture, students, and other administrators/education officers on their knowledge on the quality assessment of the KCSE agriculture project in their current assessment. This revealed their perceptions and factors determining the quality of assessment of the KCSE agriculture project. The independent variable was the teacher factors (assessor's experience, qualifications in terms of education levels, training and the period they have participated in assessing KCSE agriculture project.

2. Research Methodology

The study adopted *ex-post facto* cross-sectional survey design. Kerlinger (1978) advances the idea that surveys are useful for educational fact-finding and provide a great deal of information that is accurate. The study was carried out in Kakamega County, Kenya. Kakamega County has a population of 1,660,651people, 398,709 Households and covers an area of about 3,244.9 km^2. The Population density is 515 people per $km^{2.}$

The target population for the study consisted of 310 teachers of agriculture (County Education Office, Kakamega, 2014). Simple random sampling was used to determine the sample size of teachers of agriculture. The process involved random selection of 109 teachers of agriculture using simple random sampling from a total of 310 teachers of agriculture in the 306 secondary schools. Each school was assigned a number. The numbers were then randomly selected. A sample of 109 teachers was considered sufficient as the subjects share common attributes relevant to the study and is way above the minimum recommended sample size for a social science survey research (Kathuri and Pals, 1993).

The study utilized a questionnaire that was given to teachers of agriculture for filling. Cohen and Marion (1980) indicate that the use of a questionnaire is the best form of survey in carrying out an educational inquiry. The questionnaire was best for the teachers because they understood the questions well and lacked the time to sit and be interviewed in a healthy environment. The questionnaire used to gather data was categorized into various sections that are: personal characteristics, the effect of teacher factors, the effect of student factors and the effect of the school administration. Since most of the teachers were involved in examination supervision, and marking of end term exams, the questionnaire proved to be the right instrument. The questionnaires were distributed by the researcher and with the help of research assistants. The respondents were given ample time to complete the questionnaires that were later collected by the researcher.

The collected data was processed and analyzed using the Statistical Package for the Social Sciences (SPSS) software. The statistical tests were acceptable at ($p \leq 0.05$) level of significance. The descriptive statistics used in analyzing the data included: frequencies, proportions, percentages, means, mode, standard deviations and cross tabulations and Analysis of Variance (ANOVA) for statistical tests. The hypotheses were tested at $p<0.05$ significance level. Table 1 gives a summary of statistical the procedures used in analyzing the collected data.

3. Results

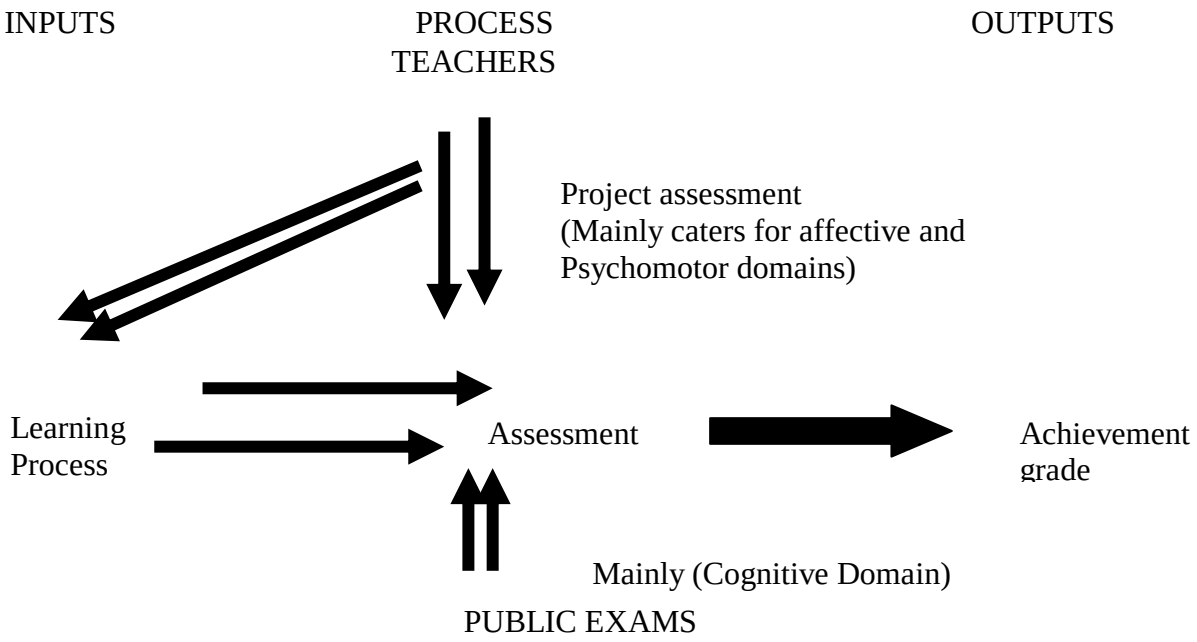

Figure 1: Proposition on quality assessment of KCSE Agriculture project exams to complement Learning process.

Table 1:

Summary of Data Analysis and Statistical Tests

Hypothesis	Independent variables	Dependent variables	Statistical Tests
There is no statistically significant effect of teacher factors on quality assessment of KCSE. Agriculture projects	Teacher factors Qualification Years of experience Integrity	Quality assessment of agriculture projects	Descriptive statistics, ANOVA

Effect of teacher factors on the Quality Assessment of KCSE Agriculture Projects

The study was to determine the effect of teacher factors on the quality of assessment of the KCSE agriculture project. Three indicators were used to assess aspects of teachers' factors that would affect the assessment of agricultural projects, and these were: qualification of the teachers, years of experience in teaching, and integrity.

Qualification of Teachers

Teacher qualification was measured in terms of the relevancy of materials prepared in the subject matter, their background, training, the disparity in marks awarded to projects and whether the teacher understood the entire project assessment process. Based on these measurable indicators, statements on the qualification of teachers were

generated. The respondents were asked to score on a five-point Likert scale (strongly agree, agree, neutral, disagree and strongly disagree. The results are given in Table 2.

Table 2:
Results on Teacher Qualification

	% of Teachers Reporting				
Indicator variables of Teacher qualifications	**Strongly agree**	**Agree**	**Neutral**	**Disagree**	**Strongly disagree**
Prepare relevant subject matter	16.5	17.4	28.4	25.7	11.9
Examiners are professionals	16.5	17.4	17.4	32.1	16.5
Examiners are trained professionals	18.3	21.1	30.3	21.1	9.2
Disparity in marks awarded	21.1	15.6	28.4	24.8	10.1
Examination process understood	14.7	20.2	26.6	17.4	21.1

n=109

The majority of the respondents (39.4 %) were positive that the examiners were trained professionals. Comparing the responses for the disparity of the marks awarded the respondents who were positive formed 36.7 %, while the ones who had negative perceptions formed 34.9 %. Forty-eight percent of the respondents felt that the examiners were not professionally trained. The majority of the teachers (38.5 %) felt that the teachers did not understand the examination process, while 34.9 % felt that they did understand the examination process. The majority of the teachers 37.6 % did not believe that the teachers prepared the relevant subject matter.

Experience Teaching Agriculture

Experience in teaching agriculture was measured by the following indicators: years supervising agricultural projects; creativity in presenting the subject matter; new teaching and instructional methods; awareness of agricultural project goals; and students' guidance on projects. The respondents were asked to score the statements on experience in teaching agriculture on a 5-point Likert scale (Strongly Agree, Agree, Neutral, Disagree, Strongly Disagree). The results of their responses are given in Table 3.

Table 3:
Results of Experience in Teaching Agriculture by Teachers

	% of Teachers Reporting				
Experience in teaching Agriculture	**Strongly agree**	**Agree**	**Neutral**	**Disagree**	**Strongly disagree**
Years supervising agriculture projects	21.1	11.9	33	22.9	11
Creative in presenting subject matter	14.7	24.8	14.7	29.4	16.5
Adopts new teaching and instruction methods	24.8	20.2	19.3	23.9	11.9
Aware of agriculture project goals	22.0	24.9	23.9	17.4	7.3
Help, guides and facilitates students with projects	22.0	19.3	22.0	22.0	14.7

n=109

The respondents were positive on three of the factors that included: that the teachers adopt new teaching and instructional methods (45 %), they are aware of the agricultural project goals (46.9 %) and that they helped, guided and facilitated the students (41.3 %). They were negative on the remaining variables: years supervising agricultural projects (33.9 %) and creativity in presenting subject matter (45.9 %). Therefore, the respondents had varied responses to the extent to which experience affects the teaching of agriculture.

Integrity of Teachers

Integrity is a vital variable in measuring teacher factors in the quality assessment of agriculture projects. Integrity is an inherent character among teachers of agriculture, one that cannot be attained through training or forced upon the employees. Integrity refers to a firm and constant adherence to a personal moral code. The integrity of teachers in this study was measured in terms of honesty in the assessment of projects; fairness to all candidates; commitment to success; answerable to assessing duties; and observe all KNEC ethical standards. The respondents were asked to

score on a 5-point Likert scale (Strongly Agree, Agree, Neutral, Disagree, and Strongly Disagree). The results of their responses on how they agreed with the statements are given in Table 4.

Table 4:
Results of integrity in Assessing Agricultural Projects

	% of teachers reporting				
Indicator Variables of Integrity in assessing projects	**Strongly agree**	**Agree**	**Neutral**	**Disagree**	**Strongly disagree**
Honesty in assessing projects	2.8	14.7	31.2	43.1	8.3
Fairness to all candidates	2.8	12.8	21.1	50.5	12.8
Committed to the success of projects	3.7	16.5	32.1	36.7	11
Answerable to assessing duties	2.8	14.7	29.4	42.2	11
Observe all KNEC ethical standards	5.5	19.3	19.3	40.4	15.6

n=109

The majority of the teachers indicated that the integrity of the teachers in assessing the KNEC agriculture projects was low or wanting (strongly agree-2.8%, agree-14.7%, neutral-31.2%, disagree-43.1% and strongly agree-8.3%). The majority of the assessors were not fair in their assessment (63.3 %), while 56 % of the respondents found the assessors do not observe the KNEC ethical standards, 53.2 % found the teachers not answerable to their assessing duties, 51.4 % of the respondents believed that the assessors were not honest in their assessment, and 47.7 % reported that the assessors were not committed to the projects.

It has been observed that integrity among staff can be impaired by both personal and institutional characteristics (Davis, 2002). This is more of the case in this study in that the principals of the schools desiring to have their schools to excel higher than others encourage the assessors to grade them upwards. The same for personal characteristics, in particular for the non-professional staff tend to lower their integrity easily. Integrity among staff can be enhanced by increased job satisfaction and commitment to the job (McGowan, 2005).

Hypothesis Testing
The study sought to determine the effect of the teacher factors on the quality of assessment of KNEC agriculture projects. The objective, the effect of the teacher factors on the quality of assessment of agriculture project work based on the qualification of teachers, teaching experience and integrity of the teachers was translated into the following null hypothesis:

> *There is no statistically significant effect of teacher factors in quality assessment of K.C.S.E agriculture project work.*

The hypothesis was tested using the analysis of variance (ANOVA). The means of level of teacher factors were evaluated against the means of quality assessment of K.C.S.E agriculture project work. The results are presented in Table 5.

Table 5:
Difference in Mean Scores for the Different Levels of Teacher Factors

Source of Variance	**The sum of Squares**	**Df**	**Mean Square**	**F-value**	**p-value**
Between Groups	24430.322	4	6107.580	88.083	0.000
Within Groups	17334.674	105	69.339		
Total	41764.996	108			

The results of the ANOVA indicate that the level of teacher factors had a positive and significant ($p<0.05$) effect on the quality assessment of agriculture projects ($F = 88.083$, $p<0.05$). Since a positive and significant association between teacher factors and quality assessment of projects was established, the null hypothesis was rejected. The mean separation was done using the Turkey's HSD and the results show that the means of the quality assessment of projects were higher for the members of staff who demonstrated a high level of teacher factors (see Table 7). The teachers with very high level of teacher factors had higher quality of assessment of projects (score 83.5) followed

the staff with High level of teacher factors (score 78.5), medium (score 60.2), Low (48.9) and finally the staff who had very low level of teacher factors (score35.8). These differences were found to be significant statistically ($p \leq 0.05$) as shown in Table 7.

Table 6:
Multiple Range Test (Turkey's HSD Procedure)

Teacher factors	n	Mean (score)	VL	L	M	H	VH
Very Low (VL)	22	35.83					*
Low (L)	68	48.92					*
Medium (M)	15	60.24					*
High (H)	2	78.50					*
Very High (VH)	2	83.50	*	*	*	*	
Total	109	-	-				

*means are significantly different at $p \leq 0.05$

These results, therefore, indicate that there was a positive and significant relationship between the teacher factors and the quality of assessment of agriculture project. These findings are incongruent with the findings of Becker (1998) who noted that increased employee integrity in organizations led to the attraction of more customers and quality service delivery. Employees with high integrity are more likely to deliver services, and complete duties assigned to them much more effectively. Furthermore, Davis (1999) indicated that one of the most important ethical values in employees is that of integrity. The personal integrity of employees is a great determinant of success or failure of an organization. This is especially the case in public organizations, where the resources of the entity are often misused. The success of such public organizations such as the KNEC depends heavily on the integrity of their employees.

4. Conclusion and Recommendation

Results show that teacher factors affected the quality assessment of agriculture projects positively; ($p<0.05$) effect ($F = 88.083$, $p<0.05$). The Turkey's HSD results show that the means of the quality assessment of projects was higher for the members of staff who demonstrated a high level of teacher factors. These differences were found to be significant statistically ($p \leq 0.05$). The null hypothesis was thus rejected: Based on the findings of the study, the following conclusion could be drawn:

Teacher factors positively and significantly affected the quality assessment of agriculture projects in secondary schools in Kakamega County. It can be inferred that the increase in the teacher qualification, years of experience in teaching and integrity can have a positive and significant effect on the quality assessment of agriculture projects. Hence, professionally trained teachers of agriculture with experience of teaching should be the only ones to be utilized to assess the projects as these improve the quality assessment of agriculture projects

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