



## A Study on Teacher Characteristics and Students' Academic Achievement: Case of Biology subject in Selected Secondary Schools in Nandi South District, Kenya

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### ABSTRACT

*Teacher quality is widely believed to be important for effective teaching. Teacher quality is often associated with the teacher's characteristics. Despite this, there is little research on teacher characteristics and how it affects students' achievement in Kenya. The purpose of this study was to establish the relationship between teacher characteristics and students' academic achievement in Biology. The study focused on the following independent variables: teacher qualification and teacher experience and their effect on student academic achievement. The study applied a causal comparative research design. The study was conducted in Nandi South District. The target population comprised of Biology teachers of all the 26 public secondary schools. A questionnaire was used for data collection. Data was analyzed using descriptive and inferential statistical techniques. The study findings showed that there was no significant ( $p > 0.05$ ) relationship between teacher qualification and student academic achievement. The results also showed that teacher experience had significant relationship ( $p < 0.05$ ) with student academic achievement in Biology. The study recommends that increased teacher in-service training to be encouraged to improve student academic achievement in Biology, teachers to go for higher degrees (masters) to improve on student academic achievement.*

**Keywords :** Academic achievement, teacher characteristics; experience and qualification

### Introduction

UNESCO (1986) indicates that biological knowledge holds key to the attainment of the millennium development goals, which include, food security, eradication of child mortality, and reduction of the spread of HIV and AIDS among others. Teachers' characteristics studies have been conducted in Kenya and around the world. Hanushek (1996) observed that there was statistically significant relationship between teacher characteristics and student academic achievement. Adeyemo (2005) writing teacher characteristics in Nigeria found out that teacher characteristics influenced teaching and learning in classrooms. In Kenya Kathuri (1986) established that there was relationship between teachers characteristics and pupils performance in CPE. In Kenya Chepchieni (1995:15) stated, "The explanations for good or poor student's academic performance have been quite exhaustive yet controversy still exists among scholars as to what contribute singly or jointly to students' poor performance". Darling – Hammond (1998) found out that availability of qualified teachers determined the performance of students in the two types of schools. In South Africa, Coonen (1987) established that teachers involved in in-service training were more effective in classrooms as compared to teachers who had not undergone training. Thias and Carnory (1972) observed that teacher experience had significant effect on performance. The studies show that teachers' characteristics are strong determinants of students' performance in secondary schools.

### Problem statement

The overall performance of Biology in Nandi South District has been below average (Nandi South District Education Office, 2011). The low achievement and dismal performance of students in the K.C.S.E Biology examination has made educational researchers, parents and other stakeholders to be concerned about the causes of the dismal performance. Teachers have a lot of influence on their classroom practices. The review of literature has shown that inadequate studies have been conducted in Nandi South District to determine the relationship between teacher qualifications and experience towards student academic achievement in Biology. This study therefore sought to investigate the influence of teacher characteristics in influencing students' performance in K.C.S.E.

### Research Objectives

The specific objectives of the study were;

- (i) To investigate the relationship of teachers' qualification on students' academic achievement in Biology in Nandi South District, Kenya.
- (ii) To establish the relationship between teachers' experience and students' academic achievement in Biology in Nandi South District, Kenya.

### Research Hypothesis

The study considered the following hypothesis

- H<sub>01</sub> There is no significant relationship between teachers' qualification and Biology students' academic achievement
- H<sub>02</sub> There is no significant relationship between teachers' experience and Biology students' academic achievement

### Literature review

Concept of Teacher Characteristics

According to Cronbach and Gleser, (1996), the term "teacher characteristics" typically refers to qualities of teachers that can be measured with tests or derived from their academic or professional records.

### Methodology

The teacher characteristics investigated were; qualifications and experience. The study was conducted in Nandi South District, Kenya in the year 2012. The study adopted a causal – comparative research design. Role (2010) suggests that the cause – effect linkage is made logically as the research process proceeds. Therefore, in this study teacher characteristics could be a factor influencing student academic achievement in Biology. The study sampled 20 secondary schools in the district from a total population of 26. The respondents were Biology teachers from 20 secondary schools within the district. Purposive sampling was used to select Biology teachers in secondary schools that had one teacher while simple random sampling was used to select one Biology teacher in schools that had more than one teacher. Biology teachers'

questionnaire (BTQ) was used as instrument for data collection. Data collected was analysed using descriptive and inferential statistics with the assistance of Statistical Package for Social Sciences (SPSS Version 17).

## Results

### Relationship between Teacher Qualifications and Students Academic Achievement

The first objective of this study was to determine the relationship between teacher qualification and student academic achievement in Biology. To achieve this objective, a cross tabulation was carried out between teacher qualification indicators (degree, diploma, and A – Level) on rows against KCSE Biology (2007, 2008 and 2009) student academic achievement average (>5.5 below, 5.5 – 6.5 average and >6.5 high performance) on the column side. The results on the contingency table show that as the level of education increases, the student performance in increased. The result implies that Biology teacher academic qualification influence student's academic achievement.

$H_{0_1}$  : There is no significant relationship between teacher academic qualification achievements with Biology students' academic achievement

The results show that; at  $\chi^2(4, N=20) = 5.07, p = 0.28$  Biology teacher qualification and student academic achievement is not statistically significant. We therefore accept the null hypothesis. The results show that Biology teacher qualification does not influence student's academic achievement.

$H_{0_2}$  : There is no significant relationship between Biology teacher experience and student academic achievement

To test the significance of these results, a chi square analysis was carried out and the probability error was set at 0.05 levels. The results showed that; at  $(\chi^2(8, N=20) = 15.963, p = 0.043)$ , the null hypothesis is rejected and the study concludes that there is statistically significant relationship between the num-

ber of years Biology teachers have been teaching the subject and student academic achievement.

## Conclusions

The findings of the study showed that student academic achievement in KCSE Biology (2007, 2008 and 2009) was below average for 45% of the schools, 6(30%) achievement was on average while 5(25%) of schools had high student academic achievement. On teacher qualification, the study established that 65% of teachers were degree holders, 25% had diploma certificates while only 10% were untrained. Crosstabulation results showed that there was no difference in performance between teachers who had degrees or diploma suggesting that teacher qualification did not result to increased student academic achievement. The chi square result shows that there was no significant result between teacher qualification and student academic achievement. Results on teacher experience showed that most (80%) of teachers attended SMASSE cycles and this improved their student academic achievement in Biology. Participation of teachers in professional development programmes have benefited a lot with improvisation of teaching methods. This led to rejection of null hypothesis that there was no significant relationship between teacher experience and student academic achievement in Biology.

## Recommendations

- (i) Schools should encourage and support teachers to attend in – service-training courses as it was established that there is a direct relationship between teacher characteristics and student performance in examination.
- (ii) It is not only the ratio of teacher student that matters but also the quality of output from the teacher and creativity that influences better performance in Biology subject.
- (iii) Government intervention in supporting teachers and resources is critical for better results in Biology subject.

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