
Influence of Teacher Characteristics on Achievement of Students in Biology in Osun State, Nigeria

By

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ABSTRACT

This study examined the influence of teacher characteristics on achievement of senior secondary schools students in Biology in Osun State, Nigeria. This study sample 48 Secondary Schools selected by random sampling technique. The researcher designed teachers' questionnaires were administered to 145 Biology teachers. Researcher-designed validated questionnaire was used to elicit information from the respondents on the impact of biology teachers on achievement of students. Three research questions and two research hypotheses were formulated. Frequency count, chi-square statistics and ANOVA were used to analysis the data collected. Finding of this study revealed that the influence of teachers' characteristics on the achievement of senior secondary school students in Biology was significant. It was also revealed that there was a significant difference based of the academic qualification and school type. Recommendations were made based on the research findings on how the teachers will have positive influence on achievement of senior secondary schools students in Biology.

Keywords: Biology Teachers, Academic Performance, Students, Senior Secondary Schools

INTRODUCTION

Biology deals with the study of all varied aspects of living organisms. It is one of the science subjects, offered by candidates sitting for the senior school certificate ordinary level examinations. Biology is the most popular subject among the pure science subjects (Idodo, 2010). Biology is the natural science that studies life and living organisms, including their physical structure, chemical processes, molecular interactions, physiological mechanisms, development and evolution (Bagle, 2017). Ibe and Maduabum (2001) state that the knowledge of Biology to human beings is important and makes them to be more worrisome when the fluctuation in academic achievement is readily.

Shaibu (2014) noted that students' academic achievement in biology observed over a seven-year period is worsening than the other science subjects. A critical look at the importance of Biology to the nation's development vis-à-vis poor academic performance in this subject calls for serious concern. Incidentally, biology serves as the foundation for higher learning and specialized courses in the fields of pharmacy, biochemistry, nursing, medicine and other allied courses. Teachers are invariable, role models whose behaviours are easily copied by students. What teachers like or dislike, appreciate and how they feel about their learning or studies could have a

significant effect on their students. Unfortunately, however, many teachers seldomly realize that how they teach, how they behave and how they interact with students will enhance their teaching. In a nutshell, teachers' attitudes directly affect students' attitudes (Standlause, Maito and Ochiel 2013).

Okebukola (2006) argued that the quality of science teachers (biology inclusive) is a key factor ascribed to the basis of students' constant poor academic performance in examinations. Wiki, Abe and Adu (2013) noted a positive relationship between teachers' qualifications and students' academic achievement, Edu, and Kalu (2012) reported that the inadequate qualifications of teachers contributed to students' repetition of a class. Researchers have also revealed that teachers' experience exercises a huge impact on students' academic achievement. Osokoya (2008) and Adodo and Oyeniyi (2013) reported that teacher's qualification contributed marginally to students' academic achievement.

Owolabi and Adebayo (2012) examined the effect of teacher's qualification on the performance of senior secondary school students in physics. Their purpose was to determine whether the status of the teacher has any impact on the performance of the students in physics. The result indicated that students performed better in physics when taught by professional teachers. Abidoye (2015a) revealed the effect of qualification and experience of Biology teachers on the status of ecology teaching in Kwara state and the result showed that there was significant difference between qualified and unqualified Biology teacher and also students perform well under qualified Biology teachers.

Alimi, Ehinola and Alabi (2012) observed the school types, facilities and academic performance of students in private and public secondary schools. Their result revealed a significant difference in facilities available in public and private schools in Ondo state which is in favour of private school. Renu and Sudipa (2012) investigated whether the private school premium' as manifested in student learning outcomes and the result showed that students in private schools have a significantly higher mathematics score than students in public schools.

Purpose of the study

This study determined the influence of teachers' characteristics on achievement of senior secondary schools students in Biology in Osun State, Nigeria. Specifically, this study examined:

1. The influence of teachers' characteristics on achievement of senior secondary schools students in Biology in Osun State, Nigeria.
2. The influence of teachers' characteristics based on academic qualification on achievement of senior secondary schools students in Biology
3. The influence of teachers' characteristics based on school type on achievement of senior secondary schools students in Biology

Research Questions

Answers were sought for the following research questions:

1. What is the influence of teachers' characteristics on achievement of senior secondary schools students in Biology in Osun State, Nigeria?
2. Does the teachers' characteristic based on academic qualification influence the achievement of senior secondary schools students in Biology in Osun State?

3. Does teachers' characteristic based on school type influence the achievement of senior secondary schools students in Biology in Osun State?

Research hypotheses

The following hypotheses were formulated and tested in the study:

1. There is no significant difference in the influence of teachers' characteristics on achievement of senior secondary schools students in Biology in Osun State, Nigeria.
2. There is no significant difference in the influence of teachers' characteristic based on academic qualification on the achievement of senior secondary schools students in Biology in Osun State.
3. There is no significant difference on the influence of teachers' characteristic based on school type on the achievement of senior secondary schools students in Biology in Osun State

METHODOLOGY

The research methodology was done under the following headings: Research Type; Sample and Sampling Techniques; Research Instrument; Instrument Validation; Procedure for Data Collection; and Data Analysis Results. This research was a descriptive survey in which data were collected from a sample of individuals from a specific population. The sampled population was asked questions according to standardized procedures, with the aim of obtaining a composite report of the population, with regards to particular aspects and the data obtained were used to describe the population and the influence on the performance of students.

This study was carried out in senior secondary school in Osun State, Nigeria. This included biology teachers in all Secondary Schools located in Osun State, Nigeria. The study was carried out in 48 secondary schools in Osun State. The total numbers of 145 biology teachers was involved in the study. Variables that were tested in the study were: academic qualification and school type of Biology Teachers. The instrument for this study was questionnaire which consisted of two sections (sections A and B); Section A of the questionnaire requests for personal information of the Biology teachers such as; school name, teachers' academic qualification and school type. Section B of the questionnaire contains of 40 statements representing opposing viewpoints of the influence. The responses to the questionnaire items are on a five Likert scale such as Strongly Agree (SA), Agree (A), Undecided (UD), Disagree (D) and Strongly Disagree (SD).

The validity of the instrument was done by researcher's supervisor, one professor in the Department of Biological science, faculty of life science and two science educators' lecturers in the Department of Science Education, and one lecturer in area of Test and Measurement University of Ilorin for both face and content validation. Their observations and comments were effected to further sharpen the focus of the research instruments.

In addition, the research instrument was administered to forty (40) Biology teachers at three weeks interval in some secondary schools in Osun State (who did not take part in the study). The reliability of the instrument was determined using test retest method. Questionnaires were administered to Biology teachers from four schools. Data obtained from the four schools were correlated using Pearson-Product Moment Correlation Coefficient Formula which showed the reliability of the instruments to be significant ($r=0.891$).

The values obtained as $r = 0.891$ indicates that there is a high correlation between the two scores. The influence of Biology teaching scale was adapted and prepared with the 40 valid items. The maximum possible score was 160 and the minimum was zero. Lower score indicates the presence of negative influence on academic performance of students and above the average value (80) indicates the presence of positive influence of Biology teachers to the performance of students.

The researcher personally visited the selected schools for the study. The researcher sought for permission from the appropriate authorities. The administration of the questionnaires was done with the help of the Heads of Science Departments in each of the selected school. Biology teachers were encouraged to be objective in their responses. The researcher waited and collected the filled questionnaires immediately and others that could not be collected were done after a week.

DATA ANALYSIS AND RESULTS

Research Question One: What is the influence of teachers' characteristics on achievement of senior secondary schools students in Biology in Osun State, Nigeria?

Table 1: Mean Score and Chi- square (t^2) for testing influence of teachers' characteristics on achievement of senior secondary schools students in Biology in Osun State, Nigeria?

	Number of respondents	Mean Score	Std. Deviation	t^2	Df	p-value
Total	145	89.54	52.02	12.85	144	0.00

Table 1 shows the numbers of responses of Biology teachers' influence to the achievement of students in Osun State, Nigeria. The total number of respondents was 145 Biology teachers. The mean score was 89.54. The influence of teachers' characteristics on achievement of senior secondary schools students in Biology in Osun State, Nigeria was significantly since p-value (0.00) < 0.05 ($t^2 = 12.85$; df 144 and p-value 0.00). This shows that Biology teachers in Osun State, Nigeria had positive influence on students' achievement.

Research Question two: Does the teachers' characteristic based on academic qualification influence the achievement of senior secondary schools students in Biology in Osun State?

Table 2: Mean Scores and ANOVA for testing influence of teachers' characteristic based on academic qualification on the achievement of senior secondary schools students in Biology in Osun State.

Groups	Sum of Squares	Df	Mean Square	F	P-value
Between Groups	20212.55	4	5053.14	303	0.02
Within Groups	233762.44	140	1669.73		
Total	253974.99	144			

Table 2 shows that the mean square between groups was 5053.14 and for within group was 1669.73. There was significant difference between the score of qualified and unqualified Biology teachers. Influence of teachers' characteristic based on academic qualification was significant on the achievement of students' since the p-value (0.02) < 0.05. The null hypothesis 2 (H_{02}), which states that there is no significant difference in the influence of teachers' characteristic based on academic qualification on the achievement of senior secondary schools students in Biology in Osun State, is rejected.

Research Question Three: Does teachers' characteristic based on school type influence the achievement of senior secondary schools students in Biology in Osun State?

Table 3: Mean scores and Chi-square (χ^2) for testing influence of teachers' characteristic based on school type on the achievement of senior secondary schools students in Biology in Osun State.

School type	No of Respondents	Mean Score	Standard Deviation	Std. Error Mean	χ^2 value	df	p-v
Public	90	63.54	38.05	4.01	10.23	143	0.04
Private	55	88.45	43.88	5.92	8.35		

Table 3 shows that the mean scores for public was 63.54 and for private was 88.45. This indicated that there was significant difference between the score of public and private Biology teachers on the achievement of students' since the p-value (0.04) < 0.05. The null hypothesis 3 (H_{03}), which states that there is no significant difference on the influence of teachers' characteristic based on school type on the achievement of senior secondary schools students in Biology in Osun State, is rejected.

SUMMARY OF MAJOR FINDINGS

The research findings of this study as obtained from Chi-square (χ^2) and ANOVA based on the Research questions and hypotheses are summarized as follows:

1. Teachers' characteristics had positive impact on students' achievement in senior secondary school in Biology Osun State, Nigeria.
2. Teachers' characteristic based on academic qualification on the achievement of senior secondary schools students in Biology in Osun State was significant.
3. Teachers' characteristic based on school types on the achievement of senior secondary schools students in Biology in Osun State was also significant.

DISCUSSION OF FINDINGS

In this study, it was found out that teachers' characteristics had positive impact on students' achievement in senior secondary school in Biology Osun State, Nigeria. It could also be as a result of helpful behaviour, resourcefulness, enthusiasms, good method of presentation and concern for students and teachers knowledge of the subject matter and the acceptance that they are role model. This is in agreement with the findings of Okebukola (2006) who observed the Students' performance in practical chemistry argued that the quality of science teachers (biology

inclusive) is a key factor ascribed to the basis of students' constant poor academic performance in examinations.

It was found in the study that there was significant difference in the influence of teachers' characteristic based on academic qualification on the achievement of senior secondary schools students in Biology in Osun State. It could be due to the impact of the methodology that trained Biology teachers had which made them better than those of untrained Biology teachers. This finding is in agreement with the finding of Edu and Kalu (2012) who observed Influence of Academic qualification on gender on teachers' perception of difficult concept in primary science in Ikom, Educational Zone of Cross River and reported that there was significant difference in the qualifications of teachers to students' performance in the class. Osokoya (2008) and Adodo & Oyeniyi (2013) revealed towards maximizing Women's contribution to National Development through Education in Nigeria and reported that teacher's qualification contributed marginally to students' academic achievement.

It was also found in this study that the influence of teachers' characteristic based on school types on the achievement of senior secondary schools students in Biology in Osun State was also significant. The mean score of private schools Biology teachers being greater than that of public schools Biology teachers might be due to the fact that factors that were available in private schools such as monitoring the teachers are not in public schools. The finding is in agreement with the finding of Alimi, Ehinola and Alabi (2012) observed the school types, facilities and academic performance of students in private and public secondary schools. Their result revealed a significant difference in facilities available in public and private schools in Ondo state. The finding is also in agreement with the finding of Abidoye (2015b) who observed the assessment of science teachers' attitudes toward teaching in senior secondary schools in South-West, Nigeria and found out that there great significant in the influence of attitude of science teachers to students' performance.

RECOMMENDATIONS

Based on the findings of this study, it is hereby recommended that;

1. Adequate instructional materials should be made available to Biology teachers to further enhance their influence on the achievement of students.
2. Unqualified Biology teachers should be motivated and encouraged to go for further development training to further boost their morale influence on the achievement of students.
3. Concerted efforts should be made by governments to provide teachers with adequate incentives as well as conducive environment for their Biology teaching and students' learning in the public secondary schools. This will further improve influence of Biology teachers on the achievement of students.

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