

Teachers' Quality as Correlates of Students Academic Performance in Biology in Senior Secondary Schools of Ondo State, Nigeria

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The study investigated teachers' quality as correlates of students' academic performance in Biology in senior secondary schools in Ondo State. To guide the study, four research questions were raised. The multi-stage sampling technique was used to collect data from two hundred teachers (200) as respondents. A validated questionnaire titled: Teacher Quality as Correlates of Student Academic Performance with the used of simple frequency counts and percentage for analysis. From the data analysis it was revealed that: the role of professionally qualified/trained teachers is an important teacher quality which enhances students' academic achievement in biology, teaching methods adopted by the teachers significantly influence achievement of the behavior objectives. Several schools in the population of the study lacked modern instructional materials without which effective teaching and learning cannot be utilized and teachers' experience significantly influence students academic performance; capacity building forms a major aspect of teachers' experience that is yet to be given adequate attention. Its importance cannot be over emphasized in view of senior secondary school student's poor performance in both internal and external examinations. Based on these findings, appropriate recommendations were made.

Keywords: Academic performance, teachers quality, biology, secondary school students, Ondo State.

INTRODUCTION

There is no gain saying about the fact that biology occupies a very sensitive position in medical science and related discipline. This informs several efforts geared toward studying biology at a secondary level of education. Hence, it is one of the science subjects one must pass so as to qualify to offer some science courses at tertiary level of education. It is however, very disheartening and heartbreaking that despite the key role and much emphasis, being laid on biology, students at secondary school level of education are still performing woefully in this subject has being an issue of great concern to stake holders in education, most especially those in the field of science. This has been attributed to myriad of factors such as poor parenting, poor attitude of

students towards their studies [1]. Bassey [2] opined that several problems are associated with conventional method of teaching. This, indirectly result to poor performance of students. Bassey [2] attributed this syndrome in educational sector to lack of perceived competence among the learners. However Adegbite [3] and Olaleye [4] views on the causes of poor performance differs. They posited very strongly that wrong location of market place, highway, airport, industrial areas constitute an academic unfriendly environment for learners.

Agusibo [5] asserted that, many schools lack the necessary facilities for teaching generally. She however, opines that theoretical aspect of teaching alone will not make learners know the rudimentary fact of most science subjects' biology inclusive. She therefore made a clarion call to all the key players, international organization like United State Agency for International Development, World Health Organization, United Nation Education

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Scientific and Cultural Organization, United Nation International Children Education Fund, WORLD Bank and non-governmental organization to render in valuable services by rescuing most schools by making available supportive services for teaching of Biology and other science subjects that, theory alone will do more harm than good to effective learning in biology.

Concept of Biology and its importance

Biology is the science that deals with the study of varieties of living organism including ourselves (plants and animals). It also studies the way our environment evolved from triple organisms and this is intimately part of our environment. Medical advancement shows the importance of biology in our daily lives. The study of dreaded diseases, their causative agents, cure as well as the action of drugs are a way of Biological enlightenment that strives at minimizing human suffering, its tries to find cure for hereditary abnormalities like hemophilia, Down's syndrome etc, Biology has a vital role in controlling environment pollution and attractive sense of art and beauty. High yielding varieties of crop plants like rice, wheat, salt, sugar cane, etc are now bred experimentally. Disease resistant grain verbalized seeds are made (Biotechnology) and Fossils are important in locating underground oil and natural gas resources. The above use and importance have made biology a course or subject of impact in the life of individuals and the nation world as a whole; thereby prompts the learned to make it a compulsory course of study in every level of education primary, secondary, and tertiary institutions.

Teacher's Qualification

Ferguson [6] concluded from his research in Ghana that "Good teachers have distinguishable impacts on students examination score". Sanders [7] and Wenglinsky [8] found that the simple largest factor affecting academic growth of population of students is differences in effectiveness of individual classroom teachers. He further propounded that the higher a teacher is qualified, the higher his or her level education in the teaching profession.

Teachers' use of instructional materials in teaching

The use of instructional materials in the teaching process less stressful for both teacher and students (learners). A study by Akinyemi [9] revealed that the performance of Nigeria students in O/L Biology was generally poor. This was attributed by the author to many factors of teaching, of which teaching aids itself was considered as an important factor. In addition Jegede [10] reported factors responsible for students poor performance in science, technology and mathematics are poor laboratory facilities, inappropriate teaching methods and inadequate numbers of learning facilities in schools as against consistent increase in the number of students.

Bassey [2] and Omosewo [11] considered the human factors as the teacher's professional commitment, creativity, mechanical skills, initiative and resourcefulness. He said that many Nigerian science teachers were aware of possibility of improvisation but exhibited poor attitudes towards improvisation. They also noted that very few teachers practice while majority depends on imported equipment and claim that improvisation is time consuming and often depleting. The author also noted that students possessed little or no interest in improvisation.

Teacher's use of teaching methods

The method employed by the teachers in an attempt to impact knowledge on the learners is referred to as methodology.

Omotosho [12] sees teaching method as the strategy or plan that outlines the approach that teachers intend to take in order to achieve the desirable objectives. It involves the ways teachers organized and use techniques of subject matter, teaching tools and teaching materials to meet teaching objectives.

Fafunwa [13] said most untrained teachers point accusing fingers at students rather than on themselves when the students are unable to carry out the expected behaviour at the end of the lesson or examinations. Therefore teachers' plan should include:

1. Choice of appropriate teaching method
2. choice of appropriate teaching materials
3. intensive research on the topic to be taught
4. Determination of the objectives for the lesson

Ferguson [6] and Koffinan [14] carried out a study on the effect on instructional methodology and students' performance. These instructional methods he referred to as technical skills of teaching. At the end of the study, they found out that only effective method(s) of teaching can bring about effective learning, hence teachers creative and dynamic in this regard to ensure that there is an increase in average students' performance in their subject areas.

Teachers Experience and Students' Performance

Murnana and Kile [15] defined teaching experience all activities undertaken by the teachers in this pre and post teacher training exercise; it also includes participation in professional development activities geared towards equipping the teacher for better service delivery. This aspect of teacher quality has not been given adequate attention because it is a general belief that any one that can talk convincingly will do well as a teacher, not minding if he or she has experience in pedagogy.

Soelein [16] and Fafunwa [17] found a positive correlation between teachers experience and students' outcomes-some studies out by them revealed that this teachers with years of experience in the profession,

especially in science subjects turned out students with higher academic performance. This is due to the teachers experience in instructional technology and pedagogy. Imogie [18] identified some areas of teachers experience to include:

1. Pedagogical studies
2. content studies
3. instructional technology
4. post teaching training, amongst others

On pedagogical studies, he opined that teachers are able to harmonize the minds and emotions of their students in class and his produces students with higher academic achievement he defines instructional technology as the use of various media such as electronic, print and improvised materials in transmitting vital information to students. Recent students revealed that teacher with both content knowledge and instructional ability achieves a higher percentage of students' outcome than teachers without such experience. He is of the opinion that teachers post-teacher training is aimed at acquisition special skills and experience that will enhance quality service delivery which in turn has a direct impact on the students' achievement.

Statement of Problem

The roles of the teachers in student achievement cannot be over emphasized. The progressive decline in secondary school students' academic performance has raised a lot of questions as regards Nigeria's educational system, of which qualities of teachers are a key factor. Agusibo [5] however, observing that the observing that the absence of qualified teachers to teach Biology do contribute significantly to the poor performance of students in Biology. This seems to be corroborated by West African Examination Council [19] report on Biology, most especially. It is an obvious and glaring fact that in most of the secondary schools in Nigeria, some teachers teaching this subject are not professionally qualified. The professional qualifications required of any teacher in Nigeria are NCE, BSC (Ed), B.Ed or PDGE in cases where teachers are not professionally qualified. On general note, teachers without educational background have been found to be ineffective teachers in terms of instructional delivery competence. It is against this background this study was carried out to ascertain teacher quality as a correlate to students' performance in Biology of senior secondary schools in Ondo state, Nigeria.

Objective of the Study

The broad objective of this study is to investigate the roles which the teachers' quality plays on students' academic performance in biology of senior secondary schools in Ondo state, Nigeria. It specifically sought to:

- (i) Establish the difference between students' taught by

professionally trained teacher and those that are taught by non-professionally trained teachers,

- (ii) Ascertain whether teachers' experience enhance better performance of students in Biology and
- (iii) Examine whether teachers' use of instructional material improves students' academic performance.

Research Questions

To effectively carry out this research, the following questions were raised:

- (i) Do students perform better when taught by professionally trained teachers than when taught by non-professional teachers?
- (ii) Does teachers' experience enhance better performance of students in Biology?
- (iii) Does a teacher's use of appropriate instructional material improve students' academic performance?

Significance of the Study

The findings of the study will broaden student's knowledge, steer up their interest in biology and improve the teaching skills of teachers in various senior secondary schools in the study area and Nigeria at large. It is hope that findings of this study will build a proper link between students' academic performance in biology in Ondo State and the quality needed for teacher's effectiveness in handling this subject across the state.

Scope of the study

This study will be limited to the Teachers' quality as correlates of student's academic performance in biology in senior secondary schools in Ondo state It will also investigate the impact of instructional materials and methodology used by teachers as its aid students' academic performance and achievement. It will be conducted in Ondo States' senior secondary schools. The State is located in the Southwestern Nigeria. It is the State with the highest emphases on formal education

METHODOLOGY

Population of the Study

The population comprises of five (5) local governments area in Ondo south senatorial district and two schools were selected from each LGAs together with random selection of twenty (20) students per school making two hundred (200) students as respondent for this study.

Sample and Sampling Technique

The multi-stage sampling technique was used to collected data from 200 respondents. First stage involves

Table 1a. Representation of respondents by class.

SSS I	SSS II	SSS III	Total No respondents
40	70	90	200

Table 1b. Students responses to teachers professionalism.

Items	Response		Total No. of questionnaire shared	% of response		Total
	Yes	No		Yes	No	
1 Does your teacher control/mange class well?	120	80	200	60	40	100
2 Does your teacher give assignment regularly?	85	115	200	47.5	52.5	100
3 Do you understand lesson note given by your teacher?	150	50	200	75	25	100
4 Does your teacher encourage you to study biology?	110	90	200	55	45	100
5 Is your biology lesson boring?	125	75	200	65.5	37.5	100
Mean (x) of the percentage (%)				60%	40%	100%

purposive selection of Ondo south senatorial district based on accessibility to the respondents. Second stage also involve the purposive selection of five (5) local government based on number of schools in the area. The third stage involves the simple random selection of two (2) schools per local government. In the fourth and final stage, simple random selection of twenty (20) students per school making a total of two hundred (200) students as respondents were selected for data collection of this study.

Instrument for the study

The questionnaire titled "TQCSAP" was employed as the instruments. It contained (20) twenty items derived from the research questions.

Questionnaire Administration

The questionnaire was administered to randomly select sampled senior secondary school students which was distributed and collected at the spot to ensure its reliability in the study area in order to achieve various responses.

Analytical Technique

The data collected were analysed with frequency count and simple percentage.

RESULTS

Table 1a analyses the total number of research population

according to their class e.g SSSI, SSSI, SSSII, SSSIII. It shows that SSSI class had forty respondents making a total of two hundred respondents.

Research Question 1: Do students perform better when taught by a professionally trained teacher?

From the analysis in Table 1b (items 1-5), 60% of the respondents agreed that their class is well managed by their teacher during lesson while 40% disagreed. In item 2, 47.5% of the respondents agreed that they are given assignment regularly while 52.5% disagreed. In item 3, seventy-five percentage (75%) of the respondents agreed that they understand the lesson note given by their teacher while 25% disagreed. In item 4, 55% of the respondents agreed that their teacher encourage them to study biology while 45% disagreed. Finally, in item 5, 62.5% of respondents agreed that their biology lessons are boring while 37.5% of the respondents disagreed.

Therefore, from the analysis above, the mean (x) percentage of response "Yes" is 56.4% while response "No" is 43.6%. Hence, this analysis shows that teaching methodology of the teacher enhances students' performance in biology.

Research Question 2: Does teacher's experience enhance better performance of students in biology?

An analysis of the table 2 shows that in item 16, 81% of the respondents agreed that their teacher uses entry behaviour when introducing now topic while 19% disagreed. In item 17, 52.5% of respondents agreed that their

Table 2. Do students perform better when taught by a professionally trained teacher?

	Items	Response		Total No. of question-naire shared	% of response		Total
		Yes	No		Yes	No	
16	Does your teacher refer to the simple related topic when introducing new topic?	162	38	200	81%	19%	100
17	Does your give adequate explanation while teaching?	165	95	200	52.5	47.5	100
18	Is your teacher friendly while teaching?	125	75	200	62.5	37.5	100
19	Does your teacher identify student's problem while teaching?	80	120	200	40	60	100
20	Will your teacher attitude to teaching inspire you to become a teacher in future?	50	150	200	25%	75	100
Mean (x) of the (%) response					52.5	47.5	100%

teacher gave adequate explanation when teaching while 47.5% disagreed. In item 15, 62.5% of respondents agreed that their teacher is friendly when teaching while 37.5% disagreed. In item 19, 40% of the respondents agreed that their teacher identified students' problem when teaching while 60% disagreed. In item 20, 25% of respondents agreed that their teacher attitude will encourage them to become future teacher while 75% agreed.

Therefore, the above analysis says that teacher's experience enhance better performance of students in Biology.

Research Question 3: Does teacher use of appropriate instructional materials improves student academic performance in biology?

Analysis of table 3 shows that in item 11, 30% of the respondents agreed that their teachers sometime make use of projector during lesson while 70% disagreed. In item 12, 42.5% of respondents agreed that their teacher sometime use microscope during lesson while 57.5% disagreed. In tem 13, 62.5% of respondents agreed that their teachers encouraged the use of practical work book while 37.5% disagreed. In item 14, 70% of respondents agreed that their teacher make use of chart (s) when teaching while 30% disagreed. In item 15, 52% of respondents agreed that their teacher does improvise teaching materials while 48% disagreed.

Therefore, from the analysis above, the mean (x) percentage of response "Yes" is 51.4% while response "No" is 48.6%. Hence, one can conclude that teacher use of appropriate instrument materials improves the

academic performance of students in biology.

DISCUSSION OF FINDING

From the result of the analysis, the following findings were made;

Research question 1

From the analysis in Table 1, majority of the respondents believe that students perform better when taught by professionally trained teachers. It agreed with [5] who stated that a trained teacher is one who can translate school curriculum into vivid reality; and that only trained teachers can't transmit vital information which positively impart on students' academic achievement.

Research Question 2

An analysis of Table 2 showed that teachers experience enhances better academic performance of students. It agrees with Ogunmiyi [20] that teacher's experience come to bear on students achievement at the end of lesson, and more importantly at the end of the term/session when results are published; the Promotional Examination results of selected Secondary Schools in the study area supports this view.

Research Question 3

Table 3 showed that majority of respondents is of the

Table 3. Does teacher's experience enhance better performance of students in biology?

Items	Response		Total No. of question- naire shared	% of response		Total
	Yes	No		Yes	No	
11 Does your teacher use projector where applicable while teaching?	60	140	200	30	70	100
12 Does your make use of microscope during biology lesson where applicable?	85	115	200	42.5	57.5	100
13 Does your teacher encourage the use of practical work book?	125	75	200	62.5	37.5	100
14 Does your teacher make use of charts where applicable when teaching?	110	90	200	52	48	100
15 Does your teacher improvise some teaching materials when not available?	140	60	200	70	30	100
Mean (x) of the percentage (%)				51.4	48.4	100%

view that "teachers use of appropriate instructional materials improves students academic performance".

Franzer et al. [21] Supports this view when he stressed that "a professionally qualified teacher will not be able to put his idea(s) into practice if the school setting lacks the equipment/materials necessary for him/her to translate his competence into reality.

Summary

Summary of Findings

A summary of findings arising from the research project is as follows:

1) Teaching methods of several teachers especially in practical based science courses like Biology, Physics and Chemistry etc have become largely monotonous. There is need to review teaching method of such courses towards modern practical teaching method "guided enquiry".

2) Teachers experience contributes maximally to students' academic performance. Findings revealed that teachers with cognate teaching experience turn out students with relatively higher academic achievement.

3) Teachers' use of instructional materials in teaching is paramount to students' improvement in academic performance. Findings reveal that a good number of sampled schools lacked basic instructional aid, where available they are too few to go round and often in bad shape.

CONCLUSION

From the outcome of analysis of the data presented in this study, the researcher has revealed a number of factors as regards teacher's quality in relation to students' academic performance. The result of the analysis of data presented in this study also confirm that the teacher as a person is not the sole determinant of students' academic outcome because other factors such as socio-economic status, parental education, school environment, related factors etc have significant effects in the academic performance of senior secondary school students.

The results of this study also indicate that when teaching method are effectively utilized, students academic performance will increase tremendously and that teachers experience is an added advantage in preparing students for both internal and external examination. It was also established that the quality of teachers to a large extent determine students achievement because a professional teacher will make the best of every unpleasant situation; however, an enabling environment must be created in terms of instructional aid amongst other variables for the teachers' potentials to be utilized maximally.

Recommendations

As regards to the findings of this study, the following recommendations will really be useful to better educational institutions. Most especially in the area of proper teaching and learning of biology as a subject in

senior secondary schools.

That there is need to review the teacher education and certification programme to enable it meet with international educational standards at various levels of the educational process. The need to update teacher's knowledge on ways of teaching biology and acquaint them with other new innovations is also to be emphasized. This could be made possible by frequently organizing seminars, workshops and in-service training for biology teachers.

The teachers should make use of different instructional materials as long as they are relevant to their lesson content. There is also need for the teachers to be resourceful in materials selection and planning; this is to reduce cost of production and maintenance of standard instructional materials. Local production and improvisation have always been a positive step towards the realization of this objective.

Policy-makers in the secondary school should raise fund so as to procure materials necessary for improvisation in biology and purchase of textbooks that will facilitate the effective teaching of the course.

Government should make efforts at improving the attitude of students to academic work by providing laboratories for science practical's, libraries etc, so that the learning experiences of the students can become more meaningful and at same time interesting.

Parents should be encouraged to buy recommended biology text books for their wards to supplements teachers notes. The Federal Ministry of Education and the Nigerian education research council (NERC) should establish and make functional centers for this purpose; it should also make evaluation and recommendations on specific and relevant instructional materials.

Finally there is also an urgent need to employ more qualified teachers to teach the subject (Biology) in senior secondary schools, and there should be periodic supervision and assessment in relation to the students' performance in the subject.

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Biology therefore records the highest number of students when compared to other science subjects (chemistry and physics), and it is offered in secondary schools in Nigeria by both science and non- science majors. Academically qualified teachers refer to those who have academic training as a result. George (2004) attributed poor achievement of students in Biology to Teachers Education Background , inadequacy of materials as well as administrative factors. The major objective of this study is to determine the effect of Teachers Education Background and students academic performance in Biology in secondary schools examination in Ikere local government area. Also the specific objective is to. School Size and Facilities as Correlates of Junior Secondary. Student's Performance in Oyo State, Nigeria. Pakistan Journal of Social Sciences, 5(8), 836-840. Alimi, O. S., Ehinola, G. B., & Alabi, F. O. (2012). School Types, Facilities and Academic Performance of Students in Senior Secondary Schools in Ondo State, Nigeria. International Education Studies, 5(3), 44-48. Boudreaux, M. K., Martin, R. & McNeal, L. (2016). Perceptions of Quality School Facilities- Implications for the School Administrator. International Research in Higher Education, 1(2), 164-173. Cook, M. (2002). Teacher Re Teachers' Quality as Correlates of Students Academic Performance in Biology in Senior Secondary Schools of Ondo State, Nigeria Akinfe E2, *Olofinniyi O.E1, and Fashiku C.O1 1. Department of Educational Administration and Planning, Obafemi Awolowo University, Ile Ife, Osun State, Nigeria. 2 Golden Apple College, Ode-Irele, Ondo State, Nigeria. Downloaded 30 August, 2012. Accepted 2 October, 2012. The study investigated teachers' quality as correlates of students' academic performance in Biology in senior secondary schools in Ondo State. To guide the study, four research questions were raised. T