

# **EFFECT OF TEACHER FACTOR IN ACHIEVEMENT OF STUDENTS IN BASIC SCIENCE IN ONITSHA NORTH LOCAL GOVERNMENT AREA OF ANAMBRA STATE**

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## **Abstract**

*This study investigated the effect of teacher factor on the achievement of students in basic science. Two research questions and one null hypotheses guided the study. The sample consisted of two hundred (200) JS II Basic Science students from four secondary schools in Onitsha Education Zone of Anambra State. A simple random sampling technique was used to select the sample. The instrument for data collection was Basic Science Achievement Test (BSAT). The validated BSAT used had a reliability coefficient of 0.85 using Pearson Product Moment Correlation Coefficient. Mean scores was used to answer the research questions while ANCOVA was used to test the null hypotheses at 0.05 level of significance. The study revealed that those students taught Basic Science by graduates of Education/Integrated Science teachers performed better than those taught by graduates who read only science subjects. Also, the male students that were taught by Education/Integrated Science graduates performed better than their female counterparts in Basic Science. Recommendations were made based on the findings.*

In Nigerian schools today, teacher quality is a priority area in the education policy. Science plays an important role in the scientific and technological development of a nation. Ali, Norhidayah, Dasoff, Kamaruzaman, Syuksiah, Mokhtar, Najar and

Salamt, (2009), explained that student's performance (academic achievement) plays an important role in producing the best quality graduates who will become great leaders and manpower for the country. Alimi and Balogun (2010) stated that success of any teaching and learning process which invariably influences students' academic performance depends on how effective and efficient the teachers are.

According to Reid (1995), learning preference refers to a persons "natural, habitual and preferred way" of assimilating new information. It means that students differ in ways they understand the instruction that are more effective for them. Omrod (2003), 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 learner). Students learning processes differ, some will like the teacher to come to class with instructional materials which helps them to recall during examination while others will like the teacher to teach verbally.

It is noted that the success of students in any examination depends largely on qualified and dedicated teachers. If the teachers are qualified and have mastery of their subjects, that will improve the performance of the students. Oshodi (1998), Dujilemi (2002), reiterated that students in any country cannot perform beyond the quality of the teachers. In his own contribution, Bangbade (2004), found out that teachers attributes have significant relationship with students' academic performance. According to him, such attributes include teacher's knowledge of the subject matter, communication ability, emotional stability, good human relationship with the students and interest in the job. He concluded that students whose teachers lack the knowledge of the subject matter, who have poor communication ability, poor emotional stability and lack of interest in the job perform poorly. Adeyemo (1985), Oshodi, (1998) and Oyebanyi (1993), opined that apart from the basic entry qualifications teachers possess, other attributes greatly influence their efficiency and effectiveness which invariably influence student's academic performance.

Alimi and Balogun (2010) stated that teachers' knowledge of the subject matter, pupils and methodology and techniques of imparting knowledge are great attributes which have significant effects on their academic performance. Rena (2000) explained further that for students to perform well in any examination, one of the pre-requisites is that their teachers must know them and have profound knowledge of their state of physical, intellectual and psychological readiness. The teacher must be well versed in the content of the subject matter he/she is teaching. He must know the appropriate method to adopt in different situations. Babajide (2001) found out that the poor quality of teachers in the secondary schools in the state have a negative influence on the students' academic performance in both internal and external examinations. He

concluded that one of the measures to adopt in the state to improve students' academic performance was re-orientation of teachers, by organizing in service training for them and through an adequate screening of candidates to be recruited so that the best candidates are appointed. In an effort to improve student achievement, some educational research has focused on the development of highly qualified teachers. Fenstermacher and Richardson, cited in Berliner, (2005) distinguish between good teaching and successful teaching as follows. By "good teaching" we meant that the content taught accords with disciplinary stands of adequacy and completeness and the method employed are age-appropriate, morally defensible and competence with respect to content. By "successful teaching" we mean that the learner actually acquires some reasonable and acceptable level of proficiency from what the teacher is engaged in teaching. Alexander (2005), states that the tendency to evaluate teacher qualities on the basis of student performance is given even greater emphasis. With the increased demands for accountability in line with performance standards, students' achievement is considered an accurate measure of teacher effectiveness and has become a basis for value added teacher assessment system. Lochran (2001) argues that "the outcome" question is what currently motivates teacher education. She set down three ways in which outcomes of teacher education are constructed. One of them is long term impact outcome (refers to the relationships) between teacher qualifications and student learning. Teacher qualification encompasses teachers' scores on tests and examinations, their years of experience, the extent of their preparations in subject matter and what qualifications they hold in their area of expertise and their on-going professional development. He went on to posit that the relationship between teacher qualification and student learning as the percentage of variance in student scores accounted for by teachers qualifications when other variables are held constant or adjusted.

Specifically, highly qualified teachers are required to;

1. have sufficient subject matter knowledge and teaching skills.
2. hold at least a National Certificate in Education (NCE).

Among teacher behaviors that have been shown to lead to high student achievement are efficient classroom management skills, systematic teaching approaches providing clear teaching goals and using advance organizer (Fraser and Walberg (2005); Skinner, Well Born and Connel (1990). As Wenglinsky (2002), has suggested, a teacher cannot be determined to be qualified by checking his or her education level, years of experience, or teaching certificate.

Views and empirical studies have been analyzed that poor performance of students in junior secondary schools in Onitsha North Local Government Area have

been blamed on teachers qualifications, poor quality of teaching, teacher's method of teaching, lack of qualified and experienced science teachers and poor infrastructure.

Over the year, student's performance in Basics Science has not been encouraging. The poor performance of students in junior secondary school certificate is very evident in the number of students that enroll for science including technical and scientific studies related to the subject of the junior secondary school level which also goes further to affect there enrolment at the senior secondary school.

Adeniyi (1986), Adinnu (2001), Bomide (1983) and Hopken (2002) revealed that Educational Administrators, parents and teachers alike complain of poor performance of students in sciences and many factors have been blamed such as teachers' method of teaching, teaching facilities, inexperienced teachers, content difficulty of curriculum materials, age, sex, school location, quality of instruction, non-availability of laboratories etc.

### **Purpose of the Study**

The study was designed to;

1. determine the effect of teacher factors on students' achievement in Basic Science.
2. determine the effect of teacher factors on the achievement of male and female students in Basic Science.

### **Research Question**

The following research question was formulated to guide this study:

1. What is the mean achievement scores of male and female Basic Science students taught by teachers who are graduates of Education/Integrated Science.

### **Hypothesis**

One null hypotheses guided the study:

- Ho1:** There is no significant difference in the mean achievement scores of male and female Basic Science students taught by teachers who are graduates of Education/Integrated Science.

### **Research Method**

The target population of the study comprises of five thousand, eight hundred and sixty-six (5,866) Basic Science Class Two (J.S.S. 2) students. In theory (30) public secondary schools in Onitsha North in Anambra State.

A sample of two hundred (200) J.S. II students was randomly selected out of five thousand, eight hundred and sixty-six students from four secondary schools out of the thirty (30) public owned schools in Onitsha North of Anambra State.

Sample random sampling technique was used to select two boys' schools and two girls from this zone. Basic Science Achievement Test (BSAT) was used as an instrument for the study. This instrument was developed by the researchers using Basic Science Junior WAEC question papers and Basic Science Text Books. The questions covered was based on the following Basic Science contents.

**Table 1: Table of Specification for BSAT Items Construction Showing Contents And Percentages Used.**

Content Development	Knowledge 41.7%	Comprehension 12.5%	Application 33.3%	Analysis 4.17%	Response 8.33%	Percentage 100%
Soil Fertility and Management (25%)	3	1	2			6
Animal Husbandry (20.87%)	2	1	2			5
<b>Types of Disease</b>						
Organism of crops Animal (33.3%)	3	1	3		1	8
Husbandry (20.83%)	2		1	1	1	5
<b>Total (100%)</b>	<b>10</b>	<b>3</b>	<b>8</b>	<b>1</b>	<b>2</b>	<b>24</b>

This validated BSAT had a reliability coefficient of 0.85 using Pearson's product movement correlation coefficient.

### **Treatment Procedure**

The two groups (groups I and II) students used were first pretested with BSAT. Then the experimental group was taught the selected Basic Science concepts by a teacher that had a degree in Education/Basic Science in their intact classes immediately after their lessons while the control group was taught by another teacher that had a degree in Education/Physics in the students' intact classes. These teachers were paid to teach those students using a common plans for experimental group and common one for the control group. The two groups were taught for four weeks of a double period of 80 minutes per week during school period the school teachers were used for both the pre-test and post-test. The teacher used were trained for the period of two weeks for the research. The total number of students randomly selected for the research was 200, comprising of 120 female and 80 male students for both the experimental and control group. After the four weeks, three days were allowed for revision. After that, a post test was given to all the groups. The gain in knowledge of the topics was determined using the pre and post test BSAT scores.

The results were analyzed using the mean to answer the research questions and Analysis of Covariance (ANCOVA) was used to test the hypotheses at 0.05 level of significance.

**Presentation of Results**

The results were presented in tables according to the research questions and the hypotheses. Data for answering research question 1 is presented in Table 2.

**Table 2:** Mean Achievement scores of Basic Science Students taught by Education/Integrated Science graduates and those taught by Education/ Physics graduates.

Group	Mean of Pre-test	Mean of Post-test	Gain Score
Experimental 1 (Males)	15.12	60.36	45.16
I (Females)	20.04	50.22	30.18
Control 1 (FMales)	15.46	44.88	29.42
II (Females)	13.29	43.26	29.98

From the table above, males and females in group 1 have higher gain scores than those in group II.

**Table 3: Mean Scores of Males and Females Basic Science Students in Experimental Group.**

Group	ITEMS	Mean of Post-test	Gain score
1 Group I (Males)	15.12	60.36	45.16
2 Group 1 (Females)	20.04	50.22	30.228

**Table 4:** Summary of ANCOVA for Groups 1 and II Males and Females i.e. For experimental and control Groups

**ANCOVA Table**

Source of Variation	Post-test sum of Square	Post-test Sum of Square	Sum of Product	Adjusted sum of Product	Df	Mean of Square	F.cal	F.05
Between	1232.575	666.595	8841.43	10284.85	195	52.74	45.19	2.60
Errors	23104.42	18962.12	2584.33	18859.06	198	95.25		
Total	2436.995	19627.715	34688.75	8574.21	3	2858.07		

Since  $f\text{-cal} = 45.19 > f\text{-tab} = 2.60$ , hypothesis 1 is rejected so there is a significant difference between groups 1 who were taught by Education/Integrated

Science graduate teacher and those in group II taught by Education/Physics teacher in Basic Science.

### **Discussion of Findings**

The result of the findings has shown that there is no significant difference in the mean achievement scores of students taught basic science by graduates of Education Basic Science and those who were not a Basic Science Teacher

Results in tables 2 and 3 (used in answering research questions) show that those Basic Science students taught by Education/Integrated Science graduate teacher had significantly higher gain saves than those students taught by Education/Physics graduates teacher. Also those male students in group 1 performed significantly better than their female counterparts also in group 1. Although all the students had enhanced achievement after the treatment, the result tends to favour the experimental group more than the other group. This agrees with the findings of Igbokidi (2006), that the problem facing the teaching and learning of Basic Science in Junior Secondary school in Nigeria is lack of well qualified teachers who read the subject. The effect was that when much of the untrained teachers (usually of any science subject) are in the field, low performance of students will occur. This is because these teachers cannot teach the different arms of Basic Science effectively. Some of these teachers who teach this subject do not study even the major subjects (chemistry, physics, biology) but any science subject. The result is poor achievement on the part of the students. A times some of these teachers do not even want to teach but due to one reason or the other, they found themselves teaching. This attested to the view of Soyibo (2006), who noted that most of the people who read education courses inevitably do so when they have failed to qualify for their favourable courses or career. In effect, the teaching work is carried out with drudgery thereby providing opportunities for the low academic achievement of the students.

### **Conclusion**

From the foregoing, it can be clearly concluded that teachers are the driving force behind students' good qualitative science education. So to reduce poor achievement of students in Basic Science and Science in general, those teachers that studied the subjects should be employed to teach those subjects.

### **Recommendations**

In line with the findings, the researcher made the following recommendations:

1. Qualified and dedicated basic science teachers who are graduates of Integrated Science should be employed to teach the subject in secondary school.

2. The government should provide opportunities for teachers of Basic Science that are not Basic Science graduates to go for in-service training, conferences and workshops to learn those aspects of Basic Science that they cannot teach effectively.

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