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# Influence of Teacher Personality Factors on Biology Students' Academic Performance in Calabar South Local Government Area of Cross River State, Nigeria

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## ABSTRACT

The purpose of this study was to investigate the influence of teacher personality factors on biology students' academic performance in Calabar South Local Government Area of Cross River State, Nigeria. In pursuance of this objective, four Research questions were raised and converted to four null hypotheses. Ex-post facto design was adopted for the study. SS2 biology students of public secondary schools in study area constituted the population of the study. The sample consisted of 438 students randomly selected from eight public secondary schools in the study area. Teacher personality factors (TPFQ) questionnaire and Biology achievement test (BAT) were the instruments used to collect data. Data was analyzed using Pearson Product Moment Correlation Analysis. Findings revealed that there was a significant positive influence of teacher creativity, educational qualification, teaching method, teacher-students relationship on students' academic performance in biology in the study area. It was concluded that teacher personality factors positively influence biology students' academic performance. It was therefore recommended among others that teachers with positive personality abilities should be engaged in the teaching and learning of biology in secondary schools.

**Keywords:** Teacher Personality, Biology Students, Academic Performance, Calabar & Nigeria

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## 1. INTRODUCTION

The need for biology education cannot be overemphasized. This is because biology cuts across almost all aspects of life. In Nigeria, it has been made a core subject among other sciences at the Senior Secondary One level of education. This is in order to acquaint all students with the necessary skills to tackle imminent hurdles of life (Kirscher, 2012). However, over the years, reports have shown an alarming rise in poor performance of students in biology. Given the relevance of biology, it becomes necessary to explore possible ways students could be helped to perform optimally well in the subject; this has given birth to several researches on the problem. Several reasons have been adduced for the problem. Some studies attribute the problem to teacher variables such as those which deal with personality traits and ability of teachers (Asuquo, 2010; Chiemeke, 2010; Davis, 2012; and Robinson, 2013). These studies argue that in most secondary schools, competent biology teachers are not readily available, teachers' creativity, personal attribute and instructional method of the teacher as well as teacher-students relationship are not taken into consideration, when impacting knowledge.

These personality factors when properly and maximally utilized, Davis (2012) explained would promote academic performance among secondary school students in biology. The present research therefore seeks to find out the extent of influence of teacher personality factors of: creativity, professional qualification, method of instruction and teacher-student relationship on biology students' academic performance in Calabar South of Cross River State, Nigeria.

## 2. LITERATURE REVIEW

According to Floyd and Brian (2011), teacher creativity is not the sole determinant of personality factor leading to students' good academic performance in biology but it is one of the major teacher personality components if students' good performance in biology is to be achieved. Without biology teacher being creative in terms of knowledge acquisition and at the same time knowing the techniques and materials that can be applied in biology teaching and learning process, students' good academic performance may not be achieved. According to Chiemeke (2010), a study carried out in 2002 using 200 students and 100 teachers in five public secondary school in Imo state indicated that 92.8% of the teacher were creative enough to impact high knowledge of biology to students which led to promotion of academic performance

In view of this, Chiemeke (2010) asserted that teacher without creative ability to teach biology cannot be termed a good teacher and may not achieve the set goals of producing students with good academic performance in biology subject. The students in turn may not be able to impact sufficient knowledge of biology to others. A biology lesson that is meant to achieve its set objective in terms of students' acquisition of basic skill and knowledge of biology is known by the teacher's creativity skills. A creative teacher knows the students and teach to the level of the students' aptitude and makes teaching interactions more interesting so as to arouse the interest of the students to knowledge acquisition (Wilfong, 2013).

According to Balka and smith (2014), a good creative teacher will make biology practical materials available and accessible to students' usage, be well informed on the changing current trends about biology subject and at the same time ensure every biology student is conversant with the modern and current issues about biology. Studies in the area of teacher personality in relation to students' academic performance have shown that without a teacher with creative ability to teach the subject, good academic performance of students cannot be obtained maximally (Asuquo, 2010). Surprisingly, despite the great importance of teacher creativity ability and skill as one of the core components of teacher personality factors in the promotion of students' academic performance in biology, research evidence showed that most Nigerian public schools especially in the rural areas do not have biology teachers that are creative enough (Chiemeke 2010).

A study carried out by Macaruse and Hook (2014) indicate that academic qualification of teachers in biology is very vital and necessary in teaching and learning process in the contemporary world. This is because teacher's qualifications improves teacher's knowledge of the subject and make teaching by such teacher interesting. Reiser (2013) observed that teachers sometimes blame students for poor academic performance, low intelligent quotient, but one of the most contributing factors towards this is poor knowledge of the subject contents by the teacher because he or she lacks the requisite knowledge, training and academic qualification needed for teaching and learning to thrive. Studies have indicated that a teacher without academic qualification in biology gives students inaccurate and insufficient knowledge in his teaching process, this support the expression of garbage in-garbage out, what the teacher gives to the students in terms of knowledge impartation is what the students will know about biology and also determined the level of such student academic performance (Macaruse and Hook, 2014). Studies have shown that the higher academic qualification a teacher obtains in biology the greater the knowledge he possesses and also the better the students' knowledge in the subject from such teacher and good academic performance (Sither, 2014).

Another Study carried out in 2007 using SS1 students in secondary schools in Abia state Nigeria in internal examinations confirmed that teachers with National certificate on education qualification could only contribute 30.2% pass of their students in the state overall rating performance of students in biology, while 60.8% of students pass was from the teachers with Bachelors and post graduate qualifications (Chiemeke, 2010).

On the other hand, teaching method adopted in any teaching and learning situation is significantly one of the major components of teacher personality factors. Biology learning and students acquisition of knowledge and good academic performance cannot be obtained without sufficient conducive teaching method which in biology is in the form of theoretical and practical experience. (Ruiz 2012, Robinson 2013). Balka and Smith (2014) noted that it is important to have an in depth understanding of biology by the teacher so that a suitable teaching method can be applied. Researchers have proposed that positive attitudes of teachers when teaching could contribute to high biology self-efficacy and lower biology anxiety levels of students, so proper teaching method is an important factor in helping students learn and understand biology. Positive attitude towards biology that helps students to acquired knowledge has been seen to be as a result of theoretical and practical teaching from the teacher and theoretical and practical learning from the students.

A student's belief in his or her ability which impacts the performance of tasks has been discovered to be as a result of theoretical and practical tutoring and learning of biology. Researches have also shown that theoretical and practical method of teaching biology reflects on a student's ability to perform the behavior required, producing specific outcome, and it is thought to directly impact the choice to engage in a task, the effort expended in performing it, and the persistence shown in accomplishing it (Tan and check, 2012). Study conducted by Larkin (2013) on teaching noted teaching and learning method to be one of the very key components to actualization of biology knowledge acquisition and which have very high correlation and significantly related to each other and thus described effective teaching and learning of biology to be theoretical and practical in nature. However, debate, role plays and lecture methods of teaching biology according to Ruiz (2012) are seen as poor methods of teaching and learning biology. These methods according to the author can lead to ineffective response, emotional fear of potential negative outcome and it may result to worries. Consequently, their impacts on biology are that students will hate biology subject, make negative remarks about the subject and achieve poor performance.

Positive teacher-student relationships are classified as having the presence of closeness, warmth and positivity. Research suggests that this variable has a significant influence on student achievement. In order for students to learn what is offered from an effective curriculum, they must be able to access support from their teacher (Klem & Connell, 2004). When a teacher forms positive bonds with students, the classroom becomes a supportive space in which students can engage in academically and socially productive ways (Hamre & piñata, 2001). Students who have a positive relationship with their teachers use them as a secure base from which they can explore the classroom and school settings both academically and socially, to take on academic challenges and work on social-emotional development, this includes relationships with peers, and developing self-esteem and self- concept.

Through this secure relationship, students learn about socially appropriate behaviors as well as academic expectations and how to achieve these expectations (Hamre & piñata, 2008). To Davis (2012) teacher students' relationship or social interaction is not only defined by the types of physical relation or behavior or by physical distance. It is a matter of mutual subjective orientation toward each other. When a student and a teacher have a well balanced relationship, students' academic performances tend to improve. Macaruse and Hook (2014) carried out studies on cultural socialization among secondary school student in Britain using 400 respondents. They found that some secondary school students felt confused and lost personal control when they were exposed to biology examinations because of poor relationship and intimidation from their teachers.

Poor interaction and relationships between the teacher and the students' in biology which focuses on theory and practical tend to result to anxiety of students in examinations. When cordial relationships do not exist between the teacher and the students and even among students, studies have shown that there is the tendency of the students to be uneasy, apprehensive or fearful in examinations (Tineke & Stakes 2013).

Previous researches revealed teacher personality factors to impact positively or negatively on biology students' academic performance. From the literature reviewed, it is evident that greater part of previous studies continue to come from developed countries. The purpose of the present research is to establish the extent of influence of teachers' creativity, educational qualification, teaching method and teacher-student relationship on students' academic performance in the subject of Biology, focusing on Calabar South in Cross River State, Nigeria.

**Hypotheses**

The following hypotheses were postulated

1) There is no significant influence of teacher creativity on students' academic performance in biology
2) There is no significant influence of teacher qualification on students' academic performance in biology
3) There is no significant influence of teacher teaching method on students' academic performance in biology
4) There is no significant influence of teacher-student relationship on students' academic performance in biology

## 3. RESEARCH METHODOLOGY

The study was essentially an Ex-post facto design. The population consisted of all SS2 Biology students in the study area. Simple random sampling technique was adopted to select four hundred and thirty eight students from the population who formed the study sample. The research instruments were teacher personality factors questionnaire (TPFQ) which comprised of thirty one items measuring the four sub variables under study and a thirty item biology achievement test (BAT). Thirty items of TPFQ were of the Likert type 4-point scale with (Strongly agree- 4 point, Agree- 3 point, Disagree- 2 point, Strongly Disagree- 1 point).

The respondents were required to indicate their level of agreement for each statement. In terms of validity, three experts in educational measurement and evaluation affirmed with 89% agreement that the instruments were suitable for measuring what it purported to measure. Using the test-retest reliability method, the reliability index of the instrument ranges from 0.84 to 0.99. Data were collected from the sampled schools with the help of some assistants, all the copies of the instruments were retrieved, and all were properly completed thus giving 100% return rate.

## 4. RESULTS

The data collected were analyzed and each hypothesis was tested using the Pearson Product Moment Correlation Analysis at .05 alpha level.

**Hypothesis One**

There is no significant influence of teacher creativity and students' academic performance in biology. The hypothesis was tested using Pearson Product Moment Correlation statistics since both dependent and independent variables are continuous. The result is presented in table 1.

**Table 1: Pearson Product Moment Correlation of relationship between teacher creativity and students academic performance (N=438)**

| Variables | $\bar{X}$ | S | $\sum X^2(\sum y^2)$ | $\sum xy$ | r | Sig |
|---|---|---|---|---|---|---|
| Teacher creativity | 65.412 | 7.369 | 32527.318 | 13753.303 | .486* | .000 |
| Students' academic performance | 60.157 | 6.414 | 24645.273 | | | |

* P<.05 df=436

The results in table 1 indicate that the calculated r value is .486. This means that there exists a positive and significant relationship between teacher creativity and students academic performance in biology. It suggests that students' academic performance become more positive as teacher applies creativity in teaching and learning experience and vice versa.

The significant level of the calculated r value (p=.000) is less than the critical significant level, p=.05. This means that the observed positive relationship between teacher creativity and students academic performance is statistically significant at .05 significance level and 436 degree of freedom. Thus, the null hypothesis is rejected.

**Hypothesis Two**

There is no significant influence of teacher educational qualification and students' academic performance in biology. The hypothesis was tested using Pearson Product Moment Correlation statistics since both dependent and independent variables are continuous. The result is presented in table 2.

**Table 2: Pearson Product Moment Correlation Analysis of teachers Educational Qualification and Students' academic Performance (N=438)**

| Variables | $\bar{X}$ | S | $\sum X^2(\sum y^2)$ | $\sum xy$ | r | Sig |
|---|---|---|---|---|---|---|
| Teacher Educational Qualification | 65.412 | 7.369 | 32527.318 | 9287.513 | .312* | .000 |
| Students' academic performance | 60.727 | 6.738 | 27193.173 | | | |

* P<.05 df=436

As shown in table 2, the calculated r-value is .312 indicating that there is a positive relationship between teacher educational qualification and students' academic performance in biology. This means that teachers' educational qualification improves teachers' knowledge of biology which helps students in academic performance.

Since the significance level of the observed r-value (p=.000) is less than the critical significant level, p=.05, it means the observed positive coefficient is statistically significant at .05 significant level and 436 degree of freedom. In other words, teachers with higher qualification in biology have more knowledge of the subject and it is positively and significantly related to students academic Performance. Therefore the null hypothesis is rejected.

**Hypothesis Three**

Teachers' teaching method does not significantly influence students' academic performance in biology. The hypothesis was tested using Pearson Product Moment Correlation statistics since both dependent and independent variables are continuous. The result is presented in table 3.

**Table 3: Pearson product Moment Correlation Analysis of Teachers' Teaching Method and Students' Academic Performance (N=438)**

| Variables | $\bar{X}$ | S | $\sum X^2(\sum y^2)$ | $\sum xy$ | r | Sig |
|---|---|---|---|---|---|---|
| Teacher teaching method | 93.660 | 13.908 | 115858.640 | | | |
| | | | | 23185.960 | .460* | .000 |
| Students' academic performance | 60.157 | 6.414 | 24645.273 | | | |

* P<.05 df=436

The result in Table 3 shows that the calculated r-value is .460, which implies that there is a positive relationship between teachers' teaching method and students' academic performance in biology. This means that students' academic performance increase when appropriate theoretical and practical methods are used in teaching biology. The observed positive relationship between teachers' teaching method and students' academic performance, however, statistically significant at .05 significant level and 436 degree of freedom because the significance level of the critical calculated r value p=.000 is less than the significance level, P<.05. Therefore the null hypothesis is rejected.

**Hypothesis Four**

There is no significant influence of teacher-students relationship and students' academic performance in biology.

The hypothesis was tested using Pearson Product Moment Correlation Statistics since both dependent and independent variables are continuous. The result is presented in table 4.

**Table 4: Pearson product Moment Correlation Analysis of Teachers-Students Relationship and Students' Academic Performance (N=438)**

| Variables | $\bar{X}$ | S | $\sum X^2(\sum y^2)$ | $\sum xy$ | r | Sig |
|---|---|---|---|---|---|---|
| Teacher-students relationship | 93.660 | 13.908 | 115858.640 | | | |
| | | | | 21335.240 | .380* | .000 |
| Students' academic performance | 60.727 | 6.738 | 27193.173 | | | |

* P<.05 df=436

As shown in Table 4, the calculated r-value is .380 indicating that there exist a positive relationship between teacher-students relationship and students' academic performance in biology. The observed positive relationship implies that good and effective cordial teacher-students relationship enhances good students' academic performance and interest in biology. The level of significance, P, of the calculated r value is .000. This means that the observed positive relationship between teacher-students relationship and students' academic performance in biology is statistically significance at .05 significance level and 436 degree of freedom. Therefore, the null hypothesis is rejected.

## 5. DISCUSSION OF RESULTS

Results obtained from the analyses revealed that the research hypotheses adopted by the researchers were accepted and upheld. These to an extent revealed important findings related to teachers' personality factors which influence students' academic performance in biology. The findings of the first hypothesis showed that there existed a positive influence of teacher creativity on students' academic performance in biology.

The findings corroborate the assertion of Floyd and Brain (2011) that teacher creativity is one of the major component s or factors that create the atmosphere for student s to like or dislike biology subject and perform well in the subject. They found out that without biology teacher being creative in terms of knowledge acquisition and at the same time knowing the methods or techniques that can be applied in biology teaching and learning process, students' good academic performance cannot be achieved. Studies have shown that teachers without creative ability to teach biology cannot be termed a good teacher and may not achieve the set goals of producing students with good academic performance.

The result of the second hypothesis showed that there existed a positive influence of teacher educational qualification on biology students' academic performance. This finding have support from other authors such as Davis (2012) who noted that teachers without educational qualification in biology are notice in Nigeria to teach the subject in rural areas especially in private schools. Studies indicated that this set of teachers have not produced good academic performance of students in external examinations.

The third hypothesis assessed whether teacher teaching method as one of the important component of teacher personality factors influence students' academic performance in biology. The analysis and conclusion showed that students' academic performance increases when appropriate theoretical and practical methods is used in teaching biology thus, there existed a significant positive relationship between effective teaching method of biology and good students' academic performance.

The findings is in consonance with previous studies of Floyd and Brain (2011) which found out that teaching and learning method adopted for biology lesson or studies has to be theoretical and practical in nature where students learn by seeing pictures of some of the items under the tutorship of a competent and experience teacher. Positive attitudes toward biology that help students to perform well have been as a result of effective teaching from the teacher and both theoretical and practical learning. Studies of Balka and Smith (2014) have indicated that students' ability to perform well in evaluation test and examinations in biology is as a result of having an effective teaching by the teacher.

The result of the fourth hypothesis showed that there existed a positive influence of teacher-student relationship on biology students' academic performance. It was observed that good and effective cordial teacher-students relationship enhances good students' academic performance and interest in biology.

This finding have support from other authors such as Kirsher (2012) who noted that in any classroom social learning, interaction is very paramount, and it is made up of the relationship between the teacher and the students, the students and the students and these have positive influence on the students in terms of academic performance. Macaruse and Hook (2014) observed that the teachers' attitude have a direct relationship to his or her students, when a teacher and a student have a well balanced relationship, the student by acquiring knowledge and skill from the teacher may also obtain a positive feedback of performance from the student.

## 6. CONCLUSION

The findings of this study show a positive influence of teacher's personality abilities towards students' good academic performance in biology in terms of; teacher creativity, educational qualification, teaching method, teacher-student's relationship and students' academic performance in biology.

## 7. RECOMMENDATIONS

Based on the findings of the study the following recommendations were made:

1. Teachers who are creative enough should teach biology subject in secondary schools. Teachers know and can collaborate with students effectively.
2. Teachers should on regular basis update their knowledge in biology by obtaining higher qualification to add to their experience and wider knowledge of biology subject.
3. Biology teachers should use appropriate methods to teach biology, include more practical work in their lessons in order to inculcate practical and creativity skills in students. The standard set forth by Science Teachers' Association of Nigeria on the teaching of biology should be upheld by all concerned in teaching and learning of biology especially in the area of practical work.
4. Good cordial teacher-students relationship should be promoted in schools in order to enhance confidence of the slow intelligent quotient students to perform well in school, more knowledgeable students could help others and stimulate positive attitude towards interest in biology.

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