

# Effects of Senior Secondary School Physics Students' Attitude on Performance in Jos North L.G.A Plateau State, Nigeria

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## **ABSTRACT**

*The study investigated the relationship between Senior Secondary School Physics students' attitude and academic performance in Jos North Local Government Area of Plateau State, two research questions and two hypotheses were formulated for the study. The instrument for data collection were students' attitude questionnaire (SAQ) and Physics achievement test questions (PAT). A correlation research design was used for the study. The correlation coefficient of 0.98 provides an estimate of reliability of a full test where half- test correlation is 0.96. The targeted population of the study comprised of SS II physics students in Jos North Local Government Area of Plateau State, numbering 350 students of these numbers 227 were male and 123 were female students respectively. The sample size used for this study was 200 students. A simple random sampling technique was employed to draw a representative sample for the study. The Pearson's Product Moment Correlation Coefficient 'r' was used to determine the relationship between attitude and students' academic performance. While the t-test for independence samples was used to examine the differences that existed between male and female attitude and their academic performance in physics. The finding was that there is positive relationship between Senior Secondary school students' attitude on their performance in physics. The findings further revealed that the male and female students do not differ significantly in their academic performance in physics. The recommendations made among others were that necessary measures be put in place in our educational system to remove negative behaviour in our students and enhance the development of positive attitude of the students in their academic performance.*

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**Keywords:** Attitude, Physics, Performance, and Examinations.

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## INTRODUCTION

Attitude is the disposition of the intellectual behavior of an individual which is born out of curiosity, open mindedness, honesty, and humility and, so on (Maxwell, 2001). Eagle (2002) argues that learners bring the attitudes they acquire into the classroom and they have the capacity to facilitate or hinder learning. He suggested that a deliberate effort should be made by teachers to encourage students' positive attitudes to promote the teaching and learning of science education.

Physics is the study of physical forces and quantities, the scientific study of matter, energy, motion and the way they relate with each other (Goodlad, 2009). It can also be defined as the study of natural events that has to do with energy and motion in relation to matter. National Education Research Development Center (NERDC, 2004) states the following importance of physics in humanity.

1. It helps the individuals to understand and appreciate the modern industrial and technological world.
2. It also helps individual to think clearly and logical in the Study of natural events of life which can be explained with the study of mathematical Physics.
3. It helps in the calculation of length, areas, volumes and masses of objects.

Though significant development has been made in the application of Physics in the area of Bio-engineering, principles, theories and laws of physics are utilized in alerting societal occurrences, such as: earthquake, tsunami, thunderstorm, hurricanes and, so on. Nuclear energy is utilized in the generation of nuclear power and the generation of electricity; area of medicine (Bio-physics) we have X-rays in detecting internal organ in patients, and scanning of fetus of a pregnant mother, and in agriculture science, education, engineering, space technology and the availability of bomb detectors for prompt security response and so on (Akpan, 1999).

However, the importance of physics in everyday life and national development, the performance of students in Physics remains low over the years, because Physics involves calculations which students hate and reduces their self-concept, interest, attitude and their performance in the subject. Furthermore, the abysmal performance of students in physics is a recurrent issue. For instance, WAEC (2005-2012) and NECO (2005-2012) reported low mean scores obtained by candidates in physics. The reports further indicated that candidates poorly attempted physics questions, electricity radioactivity, vector representation, simple harmonic motion, electromotive force, projectiles, and waves and so on. The low performance can be traced to some factors such as lack of qualified Physics teachers, lack of laboratory facilities, insufficient funding and poor management of physical and human resources, incessant strikes by teachers. Other factors are the nature and scope of physics visa-vise its efficacy, teaching ability, methods employed in the teaching of physics, the availability of physics teachers, the facilities for teaching physics, students' self-concept, and attitude, interest and so on, from these array of factors, self-concept, interest, attitude are also noted to be a common cause of students' underachievement in physics, (Akpan, 1999 & mankilik, 2009)

Performance of students in Physics can be influenced by their attitude towards the subject either positively or negatively and it depends on the environment in which the individuals came from. (Balogun, 2002). The issue of poor performance in physics is

disturbing because it hinders the Universities to meet up the prescribed mandate of 60% for Science/Technologies, and 40% for Arts/Humanities (National Universities Commission, 2002). This is why Mankilik and Umaru (2007) observed that the output in the field of physics from tertiary institutions is inadequate. This has adversely affected the quest for scientific and technological advancement of Nigeria. This is because the pedagogical approach used in imparting knowledge of physics to learners has become inadequate to their needs, interest and the attitudes towards Physics itself by the teachers, students. Quite often, teachers employ the use of traditional teaching methods in their teachings of physics. Studies have reported that 60% of Nigerian secondary school physics teachers use lecture method only in teaching physics, which makes the content even more abstract.

Ali, (2005) observe that most schools are not lucky to have enough physics teachers, and that the few that are available often have to cope with a large number of teaching periods and students. Consequently, teaching is accomplished through 'talk and chalk' most of the time, without considering the psychological needs, interest and attitudes of the students which will retard their self-esteem and their academic performance. Physics has been the hub of science and technology that has often been recognized as the basic tool for industrialization and national development such as the Nigerian Telecommunication SAT1R, which was launched into space to enhance Information Communication Technology (ICT) and Remote Sensing. This is against the backdrop of low performance in physics among secondary school students has consistently been reported. (Agbenta, 1999; Olarewaju, 2001 & Ogunleye, 2003)

In addition, Ogunleye (2006) remarked that despite the efforts aimed at improving science, technology and mathematics education in Nigeria,, there has been a growing public anxiety about falling standards in externally conducted examination such as the Senior Secondary School Certificate Examination (SSCE) conducted by the West African Examinations council (WAEC) and the National Examination Council (NECO) where the percentage of candidates who obtain credit pass and above in physics remains few. These and other issues underscores the need for this study to investigate the relationship between senior Secondary School Physics students' attitude and academic performance in Jos – North, Local Government Area of Plateau State.

## **STATEMENT OF THE PROBLEM**

It is generally, believed that most of our day to day accomplishment in our endeavors is highly determined by our belief in our ability to accomplish a specific task. The way people look at their abilities determines their confidence levels on how to execute the task. Similarly, it has been observed that students' conceptions of their abilities determine to a large extent their academic performance. Durojaye (2002) asserted that attitude is not a factor that should be overlooked among the causes of low academic performance. The outcomes of the different studies revealed mixed results; most theories of attitude tend to suggest that the theories correlate, positively with academic performance in Physics. Out of the many science schools, it was revealed that Students detest physics as a subject, being that the knowledge of mathematics has been their main reasons for running away from the subject. Looking at their ability negatively however, they want to study any of the science discipline, such as medicine, engineering, technology and so on. Various reasons have been advanced by different researchers as to the causes of this hatred for mathematics and by extension Physics as a subject. These factors range from teacher factor to student factor. These student factors have to do with the student's attitude towards their ability to handle Physics problems. Therefore, this research study sought to

investigate the effect of the relationship between students' attitude and their academic performance in Jos – North Local Government Area of Plateau State.

### **AIM AND OBJECTIVES OF THE STUDY**

This study investigated the effect of students' attitude and their performance scores in physics. This study was embarked upon with the view of achieving the following specific objectives, to:

1. determine the attitude of senior secondary schools two (SSII) Students and their academic performance towards Physics in Jos North L.G.A of Plateau state.
2. find out the difference between the attitude of male and female students' performance in Physics in Jos North L.G.A of Plateau state.

### **RESEARCH QUESTIONS**

The following research questions guided the study:

1. What is the nature of senior secondary school Two (SSII) Students' attitude as it relates to Physics?
2. What is the difference between the attitude of male and female students' performance in Physics?

### **RESEARCH HYPOTHESES**

1. There is no significant difference between students' attitude and performance in Physics in Jos – North local government area of Plateau state.
2. There was no significant difference between attitude of male and female on performance of Physics students in Jos – North local government area of Plateau state.
- 3.

### **METHODOLOGY**

The research was a survey, to be specific, the correlation (2-group) design, because the design described the degree of association between the variable studies

The design was considered -because it was used for the computation of Pearson product moment correlation coefficient, for interval or ratio data of this kind of survey, using the data obtained by the researcher, examined the degree of relationship between the self-concept of secondary school students and their attitude to physics subject on their academic performance. The researchers obtained data after administering the instruments involving 30 multiple choices questions, the Physics Achievement Test (PAT), and Student Attitude (SAQ) questionnaires was used to obtain the records of the student's academic performance in physics. The targeted population of the study comprised of SS II physics students in Jos North Local Government Area of Plateau State, numbering 350 students of these numbers 227 were male and 123 were female students respectively The sample for the study comprised of 200 SS II Physics students, out of which 100 are male and 100 are female students. This number of students constituted the students in the different schools used for the study.

Random selection (hat and draw) was used to select 5 secondary schools of 40 students each making a total of 200 students. The names of the schools were written on pieces of paper and shuffled in a container. A colleague was asked to select 5 schools at random from the container, one at a time without replacement. The names on the papers were noted and considered. The five senior secondary schools were sampled from senior secondary schools in Jos North Local Government Area of Plateau state Nigeria.

For the purpose of this study the researcher used a major research instruments for data collection. This Students Attitude (SAQ) questionnaire and a 30 - item multiple choices Physics Achievement test (PAT) which were developed by the researcher. The questions were given two colleagues using the face value of the questions generated and the questions were scrutinized. PAT was used in this study because it was aimed at measuring the achievement of the students; so as to find out how much learning of Physics took place among the students. The PAT covered the following concepts such as mechanics, projectile and simple harmonic motion (SHM), which consisted of 30 multiple choice objective test items, which were drawn from past WAEC/SSCE and NECO questions.

The questionnaire consisted of four point Likert scale, consisting of four points of Strongly Agree (SA), Agree (A), Disagree (D), and Strongly Disagree (SD). It also consisted of statements relating to the relationship of students' attitude on Physics concept and the total number of items. Respondents were asked to thicken the best option that suits their opinion using the four-point scale provided. The scale value of the Likert scale was rated as; SA = 4 points, A=3 point, D=2 points and SD = 1 point. The scale values of each respondent's option were totaled to get the standard deviation for the respondent.

The researcher was validated and the reliability value of the instruments determined and used in the Physics Achievement Test (PAT), consisting of 30-items multiple choices Students' Attitude (SA) questionnaires were scrutinized.

### Result

The results of the analyses are presented as shown in the table 1

#### Research question I

Is there any significant relationship between students' attitudes to Physics and their performance?

**Table 1: Summary of the pearson product moment correlation coefficient, statistics of the relationship between students' attitude and their academic performance in Physics.**

Variables	Cases	Mean	R	R <sup>2</sup>
Attitude (X)	200	61.6	0.99	0.98
Performance (Y)	200	48.34		

There is a significant relationship between students' attitude on their performance. The result shows' correlation value of 0.99, this is significant at p 0.05. Therefore, the null hypothesis was rejected. The strength of the linear relationship, ( $r = 0.98$ ) shows that 98% of the variance in achievement in Physics was explained by students' attitude to the subject while only 2% of the variance in performance was explained by other variables. It was then concluded that the students' attitude and their performance are significantly correlated. There was an effect of students' self-concept on the performance of male and female that is a significant outcome obtained from the calculation. Being ( $r = 10.90$ ), while testing for significance of correlation coefficient.

Table 2: attitude of male and female physics students

SEX	N	X	SD	t – VALUE
Male	50	61.58	13.4	- 0.33
Female	50	62.13	10.08	

Table 8: shows that the calculated t-value was -0.33 at 0.5 level of significance and degree of freedom 98, while the critical t-value is 1.980. Since the calculated t-value (-0.33) is less than the critical value (1.98), there were therefore no sufficient grounds to reject the hypothesis. The hypothesis was accepted meaning that there was no significant different between attitudes of male and those of female Physics students in Jos North LGA of Plateau State.

## DISCUSSION.

1. There is no significant correlation between Senior Secondary School two SS II students' attitude and academic performance in physics.

The hypothesis was tested from each of the five schools using the Pearson's Product Moment Correlation Co-efficient (PPMC)

1. The null hypothesis three (3) which stated that there is no significance difference in academic performance and students' attitude and was rejected; therefore, the alternative hypothesis was accepted.
2. The null hypothesis four (4) which stated that there is no significance difference between attitudes of male and those of female Physics students. It was rejected; therefore, the alternative hypothesis was accepted.

## CONCLUSIONS

The main objectives of this study were to find out if there is a correlation between attitude and academic performance. The following hypothesis was tested namely;

1. There was no significant difference between attitudes of male and those of female students to Physics.
2. There was also a linear relationship between students' attitude to Physics and their performance in Physics.
- 3.

## RECOMMENDATIONS

The researchers would like to make the following recommendations based on the findings of this study and other related results. These recommendations if adopted will go a long way in improving student's self-concept, attitude and academic performance in Physics.

1. It is imperative that necessary measures be put in place in our educational system to enhance the positive attitude of students especially the girl child education.
2. Physics teachers need to work on the students' self-concept and attitude towards getting the best performance in Physics.
3. The teachers' disposition, dedication, devotion and selflessness will a long way in helping the attitude of the students'.
4. Apart from teachers' intervention, parents, counselors, administrators, and the government also have some roles to play. As the home helps to build up the child to



overcome cultural problems, parent need to help the child to develop and learn positive attitude in Physics.

5. Proprietors of schools will need to provide instructional materials and other related material as well as employ more qualified teachers with improved status to teach the students in other to improve their attitude towards academic performance in school.

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