TOWARDS NEO- PHYSICS SUSTENANCE: A TEACHER- STUDENT APPROACH

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Abstract
The study investigated teacher-student relationship on achievement of students in physics for sustainable development in science education.A sample of three hundred physics students was randomly selected from Yaba Local Government of Lagos state.A thirty items structured questionnaire by researchers and students' scores in physics from respective physics teachers were used in collecting data.The questionnaire items were face and content validated(r=0.7) using chrombach alpha.Six hypotheses were tested at .05 level of significance.The data were analyzed with Pearson moment correlation results show that all the teacher-student variables correlated positively and significantly with student's achievement in physics.Recommendations were provided based on the results.

Keywords: *Neo-physics, sustenance, teacher-student, relationship.*

Background to the study
Teacher-student relationships are crucial for successful academic achievement. In classroom management, such relationships are the most significant factors in measuring the efficiency of teacher's work. The relationship between students and teacher has a powerful influence on the academic outcomes of students (Pianta, Hamre, & Allen; 2012).The foundations for failure or success in school often stem from experiences at the beginning of elementary school (Pianta, Hamre & Stuhima, 2003). Thus, the teacher-student relationship is an important factor for academic achievement of students. Students spend approximately 5 to 7 hours a day with a teacher for almost 10months in a year. What then should be the students'-teacher relationship of a good teacher? It is necessary that students respect their teacher as a professional and academic mentor. At the beginning of teacher's career, teachers often face difficulties in establishing a strong and healthy relationship since they are inexperienced; theyestablish too close relationship with students, which can later generate various problems in classroom discipline and education; such relationships can make other teachers lose their respect. However, teachers who experience good relationships with students reported that their students were less likely to avoid school, appeared more self-directed, more cooperative, and more engaged in learning (Birch& Ladd, 1997; Klem &Connell, 2004).

An effective teacher is not necessarily the one loved by the students but who is accorded with certain degree of respect from their students. Students do not need to be friends with teachers, they need to respect teachers and learn from them. Teachers with good communication skills and positive attitude towards teaching as well as having the interest of his/her students may definitely lead to the development of positive teacher-student relationship. Students have different strategies for learning and achieving their goals. A few students in a classroom will grasp and learn quickly, but at the same time there will be those who have to be repeatedly taught with different techniques before they can understand the content of the lesson. On the other hand, there are some students who fool around and use school as entertainment hence positive relationship will be difficult between such students and their teachers.

Effective teachers create conducive classroom environments that promote effective learning, which is a critical vehicle for improving performance of students in schools (Rimm-Kaufmann, 2013). A major supposition is that teachers who are diligent, caring, and supportive have positive effect on students. The effective teacher's classroom management system is predicated on the readiness of students to succeed. In such classrooms, students are motivated to learn, strive to meet the teacher's behavioral expectations, and a recognizance of the benefits of academic achievement. Thus, behavioral issues such as disruption or willful defiance are minimal or non -existing(Montalvo, Mansfield, & Miller, 2007; Pianta et al 2012).

Research evidence suggests that teacher-student relationship is a variable that has a significant influence on student achievement. Students who have close, positive and supportive relationships with their teachers will attain higher levels of achievement than those students with more conflictual relationships (Rimm-Kaufman, 2013). Also, research report of Montalvo, Mansfield, and Miller (2007) has shown that students will put forth greater effort and demonstrate a higher degree of persistence if they like their teachers. In addition, findings indicate that students attain better grades in classes taught by teachers they like (Montalvo, Mansfield, and Miller, 2007). If a student is personally connected to a teacher and experiencesfrequent communication with such teacher, and receives more guidance and praise than criticism from the teacher, then the student is likely to become more trustful of that teacher, show more engagement in the academic content presented, and display better classroom behavior. Such a student is likely to achieve at higher academic levels. Positive teacher-student relationships draw students into the process of learning and promote their desire to learn (Rimm-Kaufman, 2013).

Students must be able to access support from their teachers so as to learn effectively (Klem & Connell, 2004). More importantly, schooling plays a significant role in student's overall development, thus the instruction received from school should be channeled towards attaining this advancement. Also, Eggen and Kauchak (2001), Agharuwhe and Ugborugbo (2009) reported that positive teachers' attitudes are fundamental to effective teaching. They identified a number of teachers' attitudes that will facilitate a caring and supportive classroom environment as: enthusiasm, caring, firm, democratic practices to promote students responsibility, use time for lesson effectively, as well as establishing efficient routines, and interact freely with students and providing motivation for them. This is in line with Olaleye (2011) who submitted that high level of learning occur and learners feel good about themselves and the materials they are learning when teachers use instructional time efficiently. The way teachers relate with students influence their attitude toward school and their academic performance. How students perceive their teacher's attitudes to teaching in the classroom, educational qualification, teaching experience and pedagogical skills are also determinants that may have effect on student academic performances.

Physics is an important science subject for sustainable development in science education.For this purpose, the interactive process which takes place between the teacher and the students in the teaching and learning of Physics is very much essential for effective learning of the subject because the most critical aspect of student learning revolves round the content of the curriculum which can best be achieved through teacher-students interaction in a conducive environment. It is obvious to say that Physics teacher(s) who dominate classroom interaction are more likely to have students respond to him with uncooperative behavior, and such a teacher may lead his students to assume roles of domination in their contacts with other children. Whereas, a teacher whose pattern of interaction is commonly integrative very often induces cooperative behavior in his students, and the teacher leads the students to take cooperative role in relation to other children.

It is upon the above background that this study focuses at identifying teachers-student relationship related factors on academic achievement in physics, as most previous research works focus more on the students' related factors. Factors such as friendliness of the teacher, teacher's consultation by students, emotional state of teachers, teacher's classroom delivery and teacher's punctuality at classroom teaching are teacher-student relationship dimensional variables, whose influence will be examined on achievement of students in Physics for sustainable development in science education. This is based on the premise that sustainable development can only be achieved in an environment of good and positive relationship.

Statement of the Problem

In Nigeria, one of the numerous problems encountered by educational planners is the problem of teacher(s) attitudes and behavior in terms of their interaction with their students. Some teachers are harsh, not accommodating and not student friendly. All these characters may have negative effects on academic performance of students. Hence, this study investigates the influence of teacher-student relationship on students' academic performance in Physics for sustainable development in science education.

Purpose of the Study

(1) To find if there is any relationship between teacher's readiness to work and students' academic achievement in Physics.
(2) To find out the relationship between teacher's friendliness and students' academic achievement in Physics.
(3) To find out relationship between teacher's consultation and students' academic achievement in Physics.
(4) To find out if there is any relationship between teacher's punctuality at classes and students' achievement in Physics.
(5) To find out if there is any relationship between teachers' emotion and students' academic achievement in Physics.
(6) To find relationship between teacher's classroom delivery and students' academic achievement in Physics.

Theoretical Framework

The study is based on Bloom'taxonomy (Bloom, Engelhart, Furst, Hill, &Krathwohl, 1956), Mayer (2002), offers a helpful description of the teaching and learning practicesassociated with the development of cognitive skills. According to Mayer, learning requires not only the acquisition of knowledge (retention), but the ability to access and apply this knowledge in new situations (transfer). Teachers can facilitate the transfer process by providing students with opportunities to: understand —build connections between new and previous knowledge; apply —use procedures and knowledge to help solve new problems; analyze —divide information into meaningful parts; evaluate —make conclusions based on criteria or standards; and create —put pieces of knowledge together to produce new ideas. These features of students' cognitive engagement are directly promoted through teacher-student relationship.

Hypotheses

Six research hypotheses were tested at0.05 level of significance.

$H_0$1: There is no significant relationship between teacher's readiness to work and students' academic achievement in Physics.

$H_0$2: There is no significant relationship between teacher's friendliness and students' academic achievement in Physics.

$H_0$3: There is no significant relationship between teacher's consultation and students' academic achievement in Physics.
$H_0$4: There is no significant relationship between teacher's punctuality and students' academic achievement in Physics.
$H_0$5: There is no significant relationship between teacher's emotion and students' academic achievement in Physics.
$H_0$6: There is no significant relationship between teacher's classroom delivery and students' academic achievement in Physics

Significance of the study
This study revealed the existing relationship between teacher-student relationship and academic achievement in physics. It is vital that teachers establish a positive interpersonal relationship with students in order to effectively deliver the curriculum contents to students with the intentions of improving students' academic achievement. The interaction and connection between the teacher and student must be steeped in trust, respect, and admiration, which will open up pathways of learning and eventually increase student achievement. In addition, the various agencies concerned with the improvement of subject standards with emphasis on Physics would be able to see the importance attributed to teacher-students interaction and thus, aiding them through the provision of needed assistance and support in order to promote the growth and desired improvement in students' academic performance in Physics.

Methodology
This study is a survey type of descriptive design**.**The population for this study comprised all Senior Secondary School Physics Students in Yaba Local government of Lagos State out of which a sample of three hundred Senior Secondary School Physics Students were selected from the ten different Senior Secondary Schools that constituted the accessible population. The selected schools were; St Finbarrs college; Our Lady of Apostle; International school, Akoka; Eletu-Odibo Secondary school; CMS Girls High School; Gbagada Grammar School; Onitolo Secondary School; Queens' College; Aje Comprehensive High School and Berrel Avenue Secondary School.A simple random sampling technique was used. Instruments for data collection were obtained from two sources; primary and secondary (students' score in Physics obtained from sampled schools' sources). The instrument obtained from primary source was a structured students' questionnaire constructed by the researchers to measure teacher –student relationships. It consisted of two sections tagged Section A and Section B. Section A included items which focused on student bio-data, items which included; school, class, gender, age. Section B consisted of thirty items which were based on the subject of the study of 5point Likert point scale, i.e. Strongly Agree (SA); Agree (A); Disagree (D); Strongly Disagree (SD), Undecided (U). The first five items were used to elicit students' response with respect to hypothesis one. Items six to ten tested hypothesis two, hypothesis three and four were tested using items eleven to fifteen and sixteen and twenty respectively, hypothesis five and six were tested using items twenty-one to twenty-five and twenty-six to thirty respectively.

The questionnaire items were subjected to face and content validation and its empirical validity was ensured through a pilot testing in a neutral school. Its reliability coefficient r was calculated to be 0.70 using Cronbach- alpha.

Data Collection

One of the researchers visited the ten senior secondary schools selected. The items on the questionnaire were read and explained to the students with the help of their respective Physics teachers, this was to ensure that maximum cooperation and participation of the students were derived and so as not to give room for unruly behavior(s) on the part of some students during the period of data collection. The answered questionnaires were collected from the students immediately they had been completed. They were collated and compiled for analysis.

Data Analysis Method

The data collected were analysised using Pearson Moment Correlation Analysis, since the hypotheses tested for significant relationships on the use of teacher-students relationship on the academic achivement of students.

Results

H_o1: There is no significant relationship between teacher's readiness to work and students' academic achievement in Physics. Table (I) below.

Table 1:correlation of teacher's readiness to work and students achievement in physics

Correlations

		Teacher's readiness to work	Students' academic achievement
Teacher's attitude	Pearson Correlation	1	.116*
	Sig. (2-tailed)		.044
	N	300	300
Students' academic achievement	Pearson Correlation	.116*	1
	Sig. (2-tailed)	.044	
	N	300	300

*. Correlation is significant at the 0.05 level (2-tailed).

Decision: Reject H_o1 since significance level of Pearson moment correlation is less than 0.05.

$H_0$2: States that there is no significant relationship between teacher's friendliness and students' academic achievement in Physics. Table 2 shows correlation between teacher's friendliness and students' academic achievement in Physics.

Table 2: Correlation of teacher's friendliness and students achievement
Correlations

		Teacher's friendliness	Students' academic achievement
Teacher's friendliness	Pearson Correlation	1	.115*
	Sig. (2-tailed)		.046
	N	300	300
Students' academic achievement	Pearson Correlation	.115*	1
	Sig. (2-tailed)	.046	
	N	300	300

*. Correlation is significant at the 0.05 level (2-tailed).

Decision is to reject $H_0$2 since level of significance is less than 0.05from table 2.

$H_0$3 states there is no significant relationship between teacher's consultation and students' academic achievement in Physics. Table 3 below showscorrelation result

Table 3: Correlation of teacher's consultation and students' academic achievement

Correlations

		Teacher's consultation	Students' academic achievement
Teacher's consultation	Pearson Correlation	1	.148*
	Sig. (2-tailed)		.010
	N	300	300
Students' academic achievement	Pearson Correlation	.148*	1
	Sig. (2-tailed)	.010	
	N	300	300

*. Correlation is significant at the 0.05 level (2-tailed).
Decision: rejects $H_0$3 since level of significance is level than 0.05 from table 3

$H_0$4 states that there is no significant relationship between teacher's punctuality and students' academic achievement in Physics. Table 4 below shows the analysis.

Table 4:Correlations of teacher's punctuality and students' achievement.

		Teacher's punctuality	Students' academic achievement
Teacher's punctuality	Pearson Correlation	1	.120*
	Sig. (2-tailed)		.037
	N	300	300
Students' academic achievement	Pearson Correlation	.120*	1
	Sig. (2-tailed)	.037	
	N	300	300

*. Correlation is significant at the 0.05 level (2-tailed).
Decision: rejects H_o4 since the level of significance of Pearson moment value is less than 0.05

$H_0$5states that there is no significant relationship between teacher's emotion and students' academic achievement in Physics. Table 5 below shows the analysis.

Table 5 Correlations of teachers emotion and students achievement

		Teacher's emotion	Students' academic achievement
Teacher's emotion	Pearson Correlation	1	.126*
	Sig. (2-tailed)		.029
	N	300	300
Students' academic achievement	Pearson Correlation	.126*	1
	Sig. (2-tailed)	.029	
	N	300	300

*. Correlation is significant at the 0.05 level (2 -tailed). Decision: reject Ho5. Since the Pearson correlation value level of significance is less than 0.05.

$H_0$6 states that there is no significant relationship between teacher's classroom delivery and students' academic achievement in Physics. Table 6 below presented the analys is

Table 6: Correlation of teacher's classroom delivery and student's achievement

		Teacher's classroom delivery	Students' academic achievement
Teacher's classroom delivery	Pearson Correlation	1	.117*
	Sig. (2-tailed)		.043
	N	300	300
Students' academic achievement	Pearson Correlation	.117*	1
	Sig. (2-tailed)	.043	
	N	300	300

*Correlation is significant at the 0.05 level (2 -tailed).Decision: reject $H_0$6; since the significance level of Pearson correlation value is less than 0.05.

Summary of Findings

All the dimensional variables of teacher-student relationship (Teacher's Readiness to work (TRW), Teacher's Friendliness (TF), Teacher's Consultation (TC), Teacher's Punctuality (TP), Teacher's Emotion (TE), Teacher's Classroom Delivery (TCD)) correlated positively and significantly with Students Academic Achievement in physics (SAAP).

Discussions

Table 1 shows a significant relationship between teacher's readiness to work and students' academic achievement in physics.The findings are consistent with the findings of Durojaiye (1976) Akomolafe (2004) in Olaleye (2011) who found that teachers' positive attitude and good personal qualities are related to students' academic performance. Also, the research reports of Eggen and Kauchak (2001) in Olaleye (2011) show that positive teacher's attitude to work is fundamental to effective teaching. Teacher's factors identified are: enthusiasm, care, firmness, democratic practices to promote students responsibility, usage of time for lesson effectiveness, have established efficient routines, and interact freely with students and provide motivation for them.

Table 2 presented shows a significant relationship between teacher's friendliness and students' academic achievement in Physics.This is in line with the view of Howes, Hamilton, & Matheson(1994) in DeTeso (2011) who reported that children who developed stable emotion with their teachers were more successful academically, socially accepted, and sociable.

Table 3 presented above shows a significant relationship between teacher's consultation and students' academic achievement in Physics. This is in agreement with the findings of Berry and O'Connor (2009) in Rimm-Kaufmann (2013) who reported that students who are closer and less conflicted with teachers developed better social skills as they progress in their education plight than those with more conflictual relationships.

From the table 4 presented there exists a significant relationship between teacher's punctuality and students' academic achievement in Physics. In a practical classroom situation where teachers assume duties in due time, students' attainment in terms of classroom lessons are properly monitored and desired results attained.This is in line with the findings of Ofoegbu (2004) who found out that poor academic performance of students in Nigeria is related to poor teacher's performance in terms of accomplishing the teaching task, negative attitude to work and poor teaching habits attributed to poor motivation.

Table 5 presented above shows a significant relationship between teacher's emotion and students' academic achievement in Physics. This is in line with the findings of Falodun (2003) who reported that an emotional balanced teacher promotes his/her student efficient learning and as such pose correct signals to the students in the course of class room instruction.

Table 6 shows there exists a significant relationship between teacher's classroom delivery and students' academic achievement in Physics. This is in line with the findings Hamre and Pianta (2005), who reported that the quality of direct teacher instruction has positive impacts on student achievement.

Conclusion

The findings of this study has established that a positive teacher-students' relationship is essential for students' academic achievement in Physics. Teacher's readiness to work, teacher's friendliness, teacher's consultation, teacher's punctuality, teacher's emotion, and teacher's classroom delivery are the characteristics that correlated positively and significantly with students' achievement in physics

Recommendations

The findings of this study show that the entire teacher -student dimensional variables investigated within the context of this study correlated positively and significantly with achievement in physics.Hence, educational stake holders should adopt positive strategies that will develop and sustain teacher-student relationship in physics for a sustainable development is science education

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