Students' Perception of the Teachers' Attributes to the Effectiveness of Physics Teachers in Imo State Secondary Schools

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Abstract

Part of the National Policy on Education is "to provide teachers with the intellectual and professional background adequate for their assignments. For a teacher to perform the task of helping the nation achieve the aims, goals and objectives of its educational establishments, the teacher has to be effective in the performance of his task. But in recent years, students' performances in SSCE physics have been fluctuating. Nevertheless, teachers' roles, beliefs about effective teaching and their responsibilities change as well as perceptions of students. Two research questions and hypothesis each were addressed for this study. To investigate this, TIES was administered to 1,800 students across the state. Their responses were analyzed using mean ratings, percentages, Z-test and ANOVA F-test. It was observed that the physics teachers are not generally effective. Efforts should therefore be made to standardize the entry qualifications for prospective physics teachers; motivate and encourage them in attending to seminars, conferences and workshops.
Keywords: Teacher; Attributes; Perception; Effectiveness.

Introduction

Evaluating teachers and their duties in this dispensation is certainly not a new activity. It is as old as the education system in Nigeria. Nevertheless it has been through many trends and cycles that roles of teachers have changed; as values and beliefs about effective teaching and teacher responsibilities have changed and as perceptions of how students learn have also changed.

Reports about teachers' inability to take their work seriously and in turn students' low enrolment in some key science subjects; students' poor performance and their inability to transfer learning began about a decade of the Nigeria's independence (Akpochafo, 1992). The result of such reports and dissatisfaction was the emergence of the Nation Policy on Education.

Education has always been seen as a strong instrument for national development and transformation in Nigeria as in other countries (Uruakpa, 2006). So, Nigeria places hope in education and the role of her teachers for the solution of her innumerable problems ranging from political injustice, non-payment of workers' salaries, indiscipline among youths, incessant workers' strike, and in recent time, the insecurity and deadly diseases, to lack of adequate scientific technological orientation including weak education system.

Although the teacher is not the official policy maker in education in the curriculum content but as the one who implements the curriculum and translates theory into practical realities. What is most crucial is what goes on between the teacher and his/her students because he is seen as a very important factor in national development and transformation. He is seen as the hen that lays the golden eggs (Mbah, 2011). It is the teacher that uses the children as raw materials to produce the appropriate human manpower for the various sectors of a country's economy. Therefore, for a teacher to perform the task of helping the nation to achieve the aims, goals and objectives of its educational establishment, he, the teacher has to be effective in the performance of his task. One therefore wonders, with performances of students in physics examinations if most of the present day physics teachers (especially graduates) are still custodians of knowledge even in the subject area.

A professional-teacher as in physics is one who has acquired a learning skill and who conforms to ethical standards of the teaching profession in which he practices the skills (Good, 1973). Such a teacher is therefore deemed to be in a better position to influence desirable changes in the learner's behaviours. A professional physics teacher is expected to be one who is well versed in practice and theory. This is because science teaching and learning have shifted from the ordinary reception learning in which the teacher is merely the actor and the students passive recipients of the subject to a more student-centered activity.

Unfortunately while teachers are regarded as the final determiners of the curriculum and its effectiveness, a number of them see it as something to hold unto for sometime before getting a greener pasture (Akpochafo, 1992). Records show that students' entries and performances in physics in recent times have been quite disturbing and fluctuating (Mbah, 2011). A number of factors have been suggested to be responsible for the poor entries and performances. One of such factors according to 2007 WAEC reports is the effectiveness of physics teaching in schools. One very important thing is that the success of our curriculum development in physics depends largely on the teachers who execute the curriculum. Their quality play an important role in their effectiveness.

Therefore while the dearth of physics teachers in school system is known, the knowledge of the activities of the teachers towards physics does not seen to be clear (Akpan, 1999). Their effectiveness therefore is a function of the mode and duration of their training (Anyaegbunam, 1999) as well as their qualifications (Mbah, 2011). Students therefore view the way their teachers teach them differently as a result of a number of factors.

Problems

Evidence and records abound that students' enrolments in physics in secondary schools do not compare favourably with other science subjects (Mbah, 2011). Such records also show that students' performances in physics over the recent years are not encouraging and impressive. A number of factors have been suggested to be responsible for the observations. The fluctuation in students' performances in physics in secondary schools has prompted or stimulated the researcher to ask such questions as: To what extent do physics teachers' qualifications affect the students' perception of their effectiveness? To what extent do the teachers' attributes contribute to the instructional effectiveness? How do students perceive the effectiveness of the categories of physics teachers?

Objectives/Purposes

This study is aimed at:

(i) Ascertaining the students' overall perception of the effectiveness of physics teachers in

Imo State owned secondary schools.

(ii) Comparing the physics teachers' percentage scores in the identified components of the effectiveness.

(iii) Comparing categories of physics teachers' in the students' overall perception of the teachers' effectivenessThe study is considered significant in the sense that it would provide the employers of teachers the knowledge of the categories of physics teachers that would yield or produce the expected product. This may help in the employment exercises so that Ministries of Education may have a unified criteria in their employment system. The study would also afford the government the opportunity of knowing the training mode(s) that would produce the most effective teachers. While it would help institutions prepare and organize the education training manuals for the training of professional physics teachers. It would also help them to standardize their entry qualifications for prospective physics teachers. Finally, the study would tend to help prospective physics teachers to be guided properly to which of the training mode(s) to undergo.

Research Questions/Hypotheses

The following research questions and null hypotheses were addressed and formulated respectively to guide the study and test the data that were collected.

1. To what extent does students' mean rating score of the physics teacher's attributes in Imo State secondary schools affect the overall teacher instructional effectiveness?
2. To what extent does the mean rating score of the physics teachers' attributes by the students in Imo State secondary schools on each of the components/ attributes perceived as a factor in the teacher instructional effectiveness?
3. The mean score of the physics teachers in Imo State secondary schools on the whole TIES as rated by their students is not significantly greater than the expected mean of TIES ($P < 0.05$).
4. The mean percentage scores of the physics teachers on the various components/attributes of the TIES as rated by their students do not differ significantly ($P < 0.05$).

Methodology

Design

The study is a descriptive and inferential survey aimed at determining the effectiveness of physics teachers in Imo State owned secondary schools. The Teacher Instructional Effectiveness Scale (TIES) which was subdivided into 7 subscales of teachers' attributes: personal attributes; inter-personal relationship; knowledge of students; mastering of subject contents; teaching skills; teaching principles and students outcome, and consisting 42 items was used to obtain data. The data obtained were used to determine students' perception of the physics teachers' effectiveness.

Population

All the physics students from the three hundred and ten (310) Imo State owned secondary schools in the 3 educational zones constituted the target population of the study.

Sample and sampling technique

A total of one thousand, eight hundred (1,800) students from 90 sampled schools made up the sample. The schools were clustered into the 3 educational zones and Local Govt Areas from which 30 schools were purposively selected considering their locations and offering of physics as subject.

From each of the 30 schools from a zone, 20 physics students comprising 10 students each from, SS2 and SS3 were selected to complete the instrument. The selection of the SS2 and SS3 students were also purposive.

Instrument

The instrument for this study was adapted from Ogomaka (1998), validated by Mbah 2011) and three colleagues in Measurement and Evaluation and named TIES because of what it intended to measure. The scale was a 4-point Likert scale form weighted 4,3,2, and 1 for Strongly Agreed, Agreed, Disagreed and Strongly Disagreed responses respectively. The scale was a-42 item instrument subdivided into 7 attributes. The reliability of the instrument was determined using Abel's rater reliability coefficient and found to be 0.94 after a trial test of the scale using 6 schools from each of the zones and with 10 physics students from each school. The reliability coefficient was considered to be very high.

Administration of Instrument

The instrument was administered to the respondents personally and on different dates by the researcher who stayed back to collect them after about 45 minutes.

Method of Data Analyses

The data collected were analyzed for each of the seven subscales and attributes of the teachers to answer the research questions and test the hypotheses to determine teacher effectiveness. In answering the two research questions frequency distribution tables, mean rating scores and percentages were used.

On the other hand two hypotheses were tested using Z-test statistics for hypothesis 1 and one way analysis of variance (ANOVA) F-test for hypothesis 2. The expected mean of the 42 items is 105, hence the assumption is accepted when the rating mean score is less than the expected otherwise it is rejected.

Results

Table 1: Frequency distributions table of responses by students on the 42 items for the categories of teachers.

Note: Expected mean score for 42 items = 2.5 x 42 = 105

S/N	Categories of teachers	No. of Teachers	Students' mean rated score
1	NCE only	140	113.95
2	B.Sc Ed or B.A Ed or BED	980	140.23
3	B.Sc or B.A + PGDE	420	94.67
4	B.Sc or B.A only	260	72.48
Total			421.33

Table 1 shows that the mean of means of the attributes of the categories of Physics teachers across the state as rated by their students (105.33) is greater than the expected mean (105.00). This implies that students' rating of the attributes affected the effectiveness of the teachers indicating that they are not generally effective.

Table 2: Table of Responses of students' on the categories of physics teachers attributes.

S/N	Components or Attributes	No. of Items	Expected Mean	NCE Trs	B.Sc. Ed or B.AEd or BED	B.Sc or B.A + PGDE	B.Sc or B.A	Total Mean	Average mean $\bar{x}$
1	Trs. Personal Attributes	6	15	15.78	21	14.45	9.36	60.59	15.15
2	Trs. Inter-personal Relationship	6	15	17.6	16.97	13.15	13.53	61.25	15.31
3	Trs. Knowledge of Students	6	15	18	18.77	13.55	12.05	63.37	15.59
4	Trs. Mastery of contents	5	12.5	12.5	17.91	10.39	9.78	50.58	12.65
5	Trs. Teaching skills	10	25	27.17	32.14	24.97	21	105.28	26.32
6	Trs. Teaching Principles	5	12.5	13.41	15.8	12.65	10.12	51.98	13
7	Trs. Impact on learning	4	10	11.36	11.47	9.07	7.08	38.98	9.75
Mean of means									15.4

Table 2 shows that the mean of means (15.40) of students' rating of their physics teachers in this data is greater than the expected mean of the components (15.00), hence indicating that the physics teachers are not generally effective. From the table it shows that the teachers' impact on learning (outcome of the learning) may be fairly positive but the teachers are not effective at the process.

Table 3: Result of z-test Analysis of Students' Responses on Whole Teacher Attributes

$\bar{x}$	μ	S.D	n	St_{error}	Z_{cal}	Z_{tab}	Result
116.89	105	14.23	1800	0.34	39.63	1.645	H_0 Rejected

Since Z_{cal} (39.63) > Z_{tab} (1.645), H_o is rejected.

This implies that the mean rating score (116.89) on the whole TIES is significantly greater than the expected mean (105.00) indicating that the physics teachers are not effective at 0.05 significant level.

Table 4: Result of ANOVA test of students' Rating of Physics Teachers' Attributes.

Source of Variance	Sum of square. SS	Degree of freedom, df	Mean of squares, MS	F-ratio
Between Groups	54.65	6	9.11	MS_B
Within Groups	6,222.02	1,794	3.47	MS_N
Total	6,276.67	1,800		i.e. 2.63

Summary ANOVA Table

$F_{tab} = F_{(6,1794,\ 0.05)} = 2.10$

Since F_{cal} (2.63) > F_{tab} (2.10), H_o is rejected indicating that the mean percentage scores of physics teachers differ significantly showing that the effectiveness of the categories of physics teachers differ and are affected by their attributes.

Discussion

The results show that generally the physics teachers are not effective, though the students may pass in the subject in their examinations. Table 1 shows that the mean of means of students' rating (105.33) is greater than the criterion or expected mean (105.00) for the whole instrument. This result is corroborated by the result of the analysis of hypothesis 1 with Z_{cal} (39.63) > Z_{tab} (1.645), hence accepting the alternative hypothesis implying that the mean rated score (116.89) of the attributes is significantly greater than the expected mean (105.00). the results lend credence to Ali (1983) that teacher characteristic such as personal attributes, knowledge of subject etc are areas in which physics teachers must be prepared to be effective so as to make a better impact.

On the other hand the results of students' rating scores on each of the components as shown on table 2 indicate that while the mean rating scores for each component is greater than their respective expected means, that of the teachers' impact on learning is less. This is an indication that though the impact of physics teachers on students (outcome) may be positive yet they are ineffective in the process, especially at a time when students employ many means including mercenaries in collaboration with some of the schools' authorities to cheat in examinations. The problem here is in a time when the end justifies the means. One may be in difficulty of evaluating the teachers.

The results are as expected to show mastery of subject contents, teachers' skills, teachers' learning principles etc. as positive factors to teacher effectiveness though the result on impact is not a good indication of teacher effectiveness. This result is corroborated by Otung (1985) that physics is a practical subject that helps to develop manipulative skills.

Recommendation and Conclusion

In the light of these results and the implications there is need for physics teachers to be encouraged for further training and motivation in attending conferences, seminars and workshops to be abreast with current issues. Teachers' effectiveness should be encouraged often by promotion, salary increments etc. while institutions of learning should standardize their entry qualifications for prospective physics teachers and as well prepare and organize the education training manuals for their training.

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