

Evaluation of Teachers' Performance in Physics Classroom in Owerri Education Zone, Imo State, South East Nigeria

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Abstract:

This research sought to evaluate teachers' performance in physics classrooms. Descriptive survey research design was adopted with a sample of 388 respondents made up of 200 males and 188 females. Stratified random sampling technique was employed in the selection of the respondents while forced-choice likert type rating scale was employed to collect data. Data were subjected to descriptive statistics of mean and standard deviation while t-test statistic was used to test the hypothesis. Result showed that the physics teacher performed to a very great extent in the presentation of subject matter, classroom control and management. While male physics students adjudged their physics teacher performance to a great extent on both presentation of subject matter and classroom control and management, the female physics students rated them to have performed to a very great extent. Gender influenced significantly students' ratings of the performances of their physics teachers in both presentation of subject matter and classroom control and management. It is recommended that this result should be made available to the teachers so as to help them diagnose areas of strength and weakness in performance.

Keywords: Evaluation, Teachers Performance, Physics, Classroom, Teaching.

Introduction

Science and technology have often been perceived as the driving force behind economic development in the industrialized countries. This view had led many developing countries like Nigeria to invest in science education in the hope of promoting economic and social development. Science education like science in general has also become a crucial institution that is transnational in character. The institutionalization of science education as a worldwide phenomenon is very much related to the development of modern nation states. Thus, as new nations strive for socio-economic development, the role of science education is increasingly perceived as being of crucial importance to increasing the efficiency of these societies (Lee, 1992). This is why strong social support and resources are mobilized to advance the teaching and learning of science in schools and higher institutions of learning so as to promote a scientifically literate society and to produce scientific manpower to meet the economic needs of the society. Thus, science is overwhelmingly playing an outstanding role in our life and changing our entire existence in such important aspect as health, transportation, communication and power. All are really and vitally affected by science and all need to be familiar with application and implication of principles of science to be able to live effectively in a technologically world of today. Again, all need to be scientifically intelligent concerning the complicated problems with which they must deal as citizens in a democratic society.

Nigerian's need for the development of an effective science and technology appears to be overwhelming even as she is going through one of the hardest time in her history especially with regard to her economy.

Nevertheless, it is widely believed that only scientific and technological development can pull the country through the present situation. Both science and technology can provide the basis for Nigeria socio-economic and political well-being. Acknowledging this, the Federal Ministry of Science and Technology (FMST, 1986) noted that

The advance in science and technology has assured man of comfortable living, improved his thinking processes and very importantly conserved his energy for other activities...

The classification of countries according to the economic status reflects the state. Accordingly, the world is divided into two main groups, namely, the developed and the developing.(p.7)

Physics is the pivot of sciences, (Onwukwe, 2012) and is the basis of technology. Physics is a branch of science that deals with matter and energy and the relationship between them. It is sometimes referred to as the science of measurements and its knowledge has contributed greatly in the production of instruments and devices of tremendous benefits to the human race (Owosewo, 2009).

The importance of physics cannot be over-emphasized as it forms the basis for technological advancement of any nation. Furthermore, the support of physics education in all countries is important because

1. Physics contributes to the technological infrastructure and provides trained personnel needed to take advantage of scientific advances and discoveries.
2. Physics is an important element in the education of chemists, engineers, doctors, pilots and computer scientists as well as practitioners of the other physical and biomedical sciences.
3. Physics extends and enhances our understanding of other disciplines such as agriculture, chemical, biological and environmental sciences, even atmospheric sciences as well.
4. Physics improves our quality of life by providing the basic understanding necessary for developing new instruments and techniques for medical applications such as ultrasound imaging, x-rays and laser surgery.

However, it has been reported that over the years, students' achievement in various science subjects especially in physics as recorded in WAEC and NECO examinations in secondary schools has been consistently deteriorating and is very poor (Ogunleye 2000, Ugwu 2005, Eniyeju 2010, Obe and Ewuzie 2014). The interpretation is that the unsatisfactory performances of students in sciences including physics reflect how much the students understand the subject.

The continual dismal and poor performance rate in sciences and in physics in particular is a glaring indication that the Nigerian secondary education in sciences including physics is troubled, sick and in a state of decay and require urgent and full scale diagnosis for reform and improvement. More worrisome according to Obi and Ewuzie (2014) is the fact that the decline in students' performances has become a trend while education authorities are treating it with levity. If this persists, it may no doubt deny Nigeria of sustainable economic growth though at present it basks as the largest economy in Africa.

Dissatisfaction with the status of secondary school physics teaching and learning in Nigeria have led physics educators and researchers for renewed search for identifying and understanding the nature and scope of factors that influence teaching, learning, understanding and achievement in physics.

It is believed that it is not so much the problem of curriculum for the physics curriculum is adjudged by professionals to be satisfactory (FME, 2007). The physics curriculum had undergone several reviews leading to the latest 2011 edition in use. Accusing fingers have pointed at the implementation that has fallen short of expectation. Thus, having completed and effected change in the curriculum, the restructuring for transformation has to be shifted to teaching and learning environment. It has been noted by Bokovo, as reported by Obi and Ewuzie (2014) that an education system is only as good as its teachers and unlocking their potentials is the key to enhancing the quality of learning. Thus, it seems that more can be done to improve physics education by improving the effectiveness of physics teachers than by any other factor. This tends to show that physics teacher's activities and his/her attitudes have domineering effect in administration and achievement of the school physics education goals. Clearly, one problem overrides others. That is the question of who teaches the subject and how it is taught. The teacher is ultimately responsible for translating education policies and principles into actions based on best practices during interaction with the students. It thus appear that the physics teacher have difficulty in translating the new curriculum into effective classroom instruction and therefore needs to be investigated.

Furthermore, stakeholders in physics education such as state government, parents, policy makers, administrators and educators are calling for improvement and reform. Therefore, interest is further fostered by growing current need for accountability and quality improvement in the teaching profession. It is argued that stakeholders in physics education must take pain to see that the physics teacher is acquainted at first hand with evolving best practices and procedures. Thus, there is the need for summative assessment as a tool to ascertain whether physics teachers satisfy required standards and formatively to formulate guideline for professional development. The research therefore seeks to ascertain physics teachers' performances in the classroom setting especially as it affects presentation of subject matter and also classroom control and management in Owerri Education Zone of Imo State, South East Nigeria.

Purpose

Some factors of teaching behaviours have been identified as vital for effective learning and achievement in physics which if not properly investigated the achievement of aims and objectives of physics in secondary schools in Nigeria cannot be reasonably guaranteed. These are physics teacher presentation of subject matter and classroom control and management. This study intends to find out the extent of performance of the physics teacher in the various items of the factors as perceived by the physics students. It is hoped that the evaluation of the performance of the physics teacher in the various items would help to find out what skills, the physics teacher need to improve for greater effectiveness. The investigation will also help to provide the physics teacher with feedback on their own teaching very necessary for the creation of a good learning environment. It equally will help the teacher in the assessment of his performance in his/her job since the main reason for his/her employment is instructional effectiveness. It will also provide bits and pieces of information on the competence requirements in training physics education teachers. This study therefore intends to improve physics teachers' performance, increase achievement and win more students to physics by evaluating the performance of physics teachers in the secondary schools in Owerri Education Zone of Imo State. Specifically the study sought to answer the following research questions:

- RQ₁ What is the extent of physics teacher performance in the presentation of subject matter as measured by the Teaching Practice Assessment Test (TPAT)?
- RQ₂ What is the extent of physics teacher performance in classroom control and management as measured by his mean scores of students' ratings of items in TPAT?
- RQ₃ What is the mean response rating of male physics students when compared with female physics students in the various items of presentation of subject matter of TPAT?
- RQ₄ What is the mean response rating of male physics students when compared with female physics students in the items of classroom control and management of TPAT?

Ho₁ There is no statistical difference between the mean response rating scores of the physics students in the factors of performance of physics teaching in TPAT due to gender.

Procedure

The study adopted a descriptive survey research design. The research was carried out during a normal school session and intact classes were used. The area of the study was Owerri Education zone of Imo state. The sample was made up of 388 respondents which comprise 200 males and 188 female physics students while the population consists of 18170 students.

Stratified random sampling technique was employed to select the respondents. The instrument used for the study was a forced choice likert type questionnaire constructed from the various items of the two factors – presentation of subject matter and classroom control and management of teaching practice assignment test (TPAT). Each item in the physics teacher performances was scored on a maximum of 5 points viz 5 outstanding, 4 very great extent, VGE 3, Great extent (GE), 2 little extent (LE) and 1 very little extent (VLE). The accumulative score of each student gives the score on the factor of performance.

The questionnaire was administered by the researcher and collected back on the spot after completion. The data collected was subjected to descriptive statistics of mean and standard deviation and the t-test statistic was used to test the hypothesis.

Results

Four research questions and one hypothesis guided the study. The research question one RQ₁ is what is the extent of physics teacher performances in the presentation of subject matter as measured by the students ratings in the various items of TPAT in Owerri North Education Zone of Imo state?.

Table I: mean scores of the performances of physics teachers in the various items of presentation of subject matter of TPAT

S/NO	ITEMS OF TEACHER PERFORMANCES	OS	VGE	GE	LE	NA	MEAN	DEC
1.	Explains difficult concepts clearly	128	166	58	8	16	4.22	VGE
2.	Uses examples and illustration to explain	98	174	80	14	10	3.97	VGE
3.	Keeps all students in class focused in the topic	88	178	56	30	22	3.78	VGE
4.	Makes sure students understand one point before proceeding to the next.	98	152	62	20	42	3.61	VGE
5.	Approves and encourages asking questions	96	156	82	20	28	3.71	VGE
6.	Distributes questions fairly	52	158	90	40	42	3.36	VGE
7.	Makes his lesson interesting	86	152	46	30	48	3.49	VGE
8.	Answers questions exhaustively	78	134	82	26	48	3.46	VGE
9.	Engages students in verbal and written questions and answers	60	138	112	36	34	3.41	VGE
10.	Motivates and reinforces students	74	148	88	32	34	3.52	VGE
11.	Emphasizes important concepts	78	176	86	18	18	3.74	VGE
12.	Uses easy understandable, concise and simple language	80	174	74	30	20	3.70	VGE
13.	Helps students in difficulty especially during calculation.	85	153	45	31	48	3.41	VGE
14.	Writings on the board are neat and organized	79	175	74	31	19	3.65	VGE

15.	The Teacher have cordial interactions with students	87	151	46	31	47	3.51	VGE
Mean of means -		3.64 VGE						

Results from Table 1 shows that the mean of means is=3.64 which by interpretation means that the physics teacher performed to a very great extent in the presentation of subject matter during classroom teaching and learning of physics in Owerri Education Zone of Imo state. The highest performance was on explaining difficult concepts clearly, followed by using examples and illustrations to explain and clarify concepts and keep all students in check focused on their topic.

The least performance was on distributes questions fairly followed by engages students in verbal and written questions and answers and helps students in difficulty especially during calculations

Research question two (RQ₂) is ‘what is the extent of physics teachers performances in classroom control and management as measured by his measures of students ratings of items in TPAT?’

Table 2: Mean scores of the performances of the physics teacher various items in classroom control and management of TPAT

S/NO	ITEMS OF TEACHER PERFORMANCE	OS	VGE	GE	LE	NA	MEAN	DECISION
1.	Move from student to student to check student behavior	62	164	62	32	56	3.38	VGE
2.	Stop/prevent misbehavior with a minimum of class disruption	70	160	62	24	40	3.55	VGE
3.	Walks towards misbehaving student	54	156	82	34	50	3.35	VGE
4.	Looks at the student who is misbehaving sternly	80	110	92	36	52	3.32	VGE
5.	Maintain a business-like pace	58	166	46	42	48	3.33	VGE
6.	Allows Students to air their	72	158	60	23	43	3.50	VGE
7.	The lesson time is effective	78	170	80	30	18	3.52	VGE
8.	Individual differences of learners are considered	55	153	84	30	46	3.32	VGE
9.	The classroom atmosphere is relax	74	112	96	38	50	3.34	VGE
10	Interacts cordially with students in class	65	163	60	33	67	3.41	VGE
Mean of means -		3.40						

Table 2 shows that the physics teacher performed to a very great extent (VGE) with a mean rating score of 3.40 on classroom control and management. The highest item of performance was stop/prevent misbehavior with a minimum of class disruption followed by the lesson time is effectively utilized and allows students to air their view while teaching. The physics teacher however performed lowest on items looks at the student who is misbehaving sternly and individual differences of learners are considered followed by maintain a business like pace.

Research question three (RQ₃) is ‘what is the mean response ratings of male physics students when compared with female physics students in the various items of presentation of subject matter of TPAT.’

Table 3: Mean response ratings of male and female physics students on the various items of presentation of subject matter of TPAT.

S/NO	Various items of presentation of subject matter	Male	Decision	Female	Decision
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		\bar{X}_1		\bar{X}_2	
1.	Explains difficult concepts clearly	3.79	VGE	4.27	VGE
2.	Uses examples and illustrations to explain and clarify concepts	3.62	VGE	4.20	VGE
3.	Keeps all students in class focused on the topic	3.50	VGE	4.02	VGE
4.	Makes sure students understands one point before proceeding to the next	3.17	GE	4.18	VGE
5.	Approves and encourages asking questions	3.29	GE	4.16	VGE
6.	Distributes questions fairly	2.95	GE	3.79	VGE
7.	Makes his lesson interesting	2.97	GE	4.20	VGE
8.	Answers questions exhaustively	3.07	GE	3.87	VGE
9.	Engages students in verbal and written questions and answers	3.19	GE	3.64	VGE
10.	Motivates and reinforces students	3.07	GE	3.99	VGE
11.	Emphasizes important concepts	3.38	GE	4.13	VGE
12.	Uses easy, understandable, concise and simple language	3.36	GE	4.15	VGE
13.	Helps students in difficulty especially during calculations	2.90	GE	4.22	VGE
14.	Writings on the board are neat and organized	3.03	GE	3.97	VGE
15.	The teacher have cordial interaction with students	2.94	GE	4.21	VGE

Table 3b: Summary of response ratings of teachers' performances in the factors of TPAT due to gender.

Factor of teaching performances	Male X	N	S.D	Female	N	S.D
Presentation of subject matter	3.22	15	0.27	4.07	15	0.18

Data from Table 3b shows that the male physics students adjudged the physics teacher to have performed to a great extent on presentation of subject matter with mean (3.22) and standard deviation 0.27 while the female students mean rating was 4.07 and standard deviation 9.18 which is interpreted to a very great extent performance.

RQ₄ What is the mean response rating of male physics students when compared with female physics students in the items of classroom control and management of TPAT?

Table 4a: Mean response ratings of male and female physics students in the various items of classroom control and management of TPAT.

S/NO	Various items of class control and management	Male	Decision	Female	Decision
		\bar{x}_1		\bar{x}_2	
1.	Move from student to student to check student behavior	3.33	GE	3.44	GE
2.	Stop/prevent misbehavior with a minimum class disruption	3.28	GE	3.87	VGE
3.	Walks towards misbehaving students	3.18	GE	3.53	VGE
4.	Looks at the student who is misbehaving sternly	2.98	GE	3.78	VGE

5.	Maintain a business like pace	3.08	GE	3.80	VGE
6.	Allows students to air their view while teaching.	3.06	GE	3.65	VGE
7.	The lesson time is effectively utilized	3.22	GE	3.74	VGE
8.	Individual differences of learners are considered	2.86	GE	3.48	GE
9.	The classroom atmosphere is relax	2.78	GE	3.49	GE
10	Interacts cordially with students in class	3.11	GE	3.62	VGE

Table 4b: Summary of mean response ratings of male and female physics students on the various items.

	Male x_1	N	S.D	Decision	Female x_2	N	SD	Decision
Classroom control and management	3.09	10	0.18	GE	3.65	10	0.16	VGE
Overall mean	3.16	25	0.24	GE	3.90	25	0.27	VGE

Data from Table 4b shows that the male students mean rating score on classroom control and management was 3.09 and standard deviation 0.18 while the female students mean rating score was 3.65 and standard deviation 0.16. According to male students' rating, the physics performed to a great extent while the female students rated their physics teachers to have performed to a very great extent on classroom control and management.

Table 5: Results of t-test statistic of teachers performances due to gender.

S/N	Factor of Teaching Performance	Male \bar{x}_m	Female \bar{x}_f	sd_m	Sd_f	df	t_{cal}	Probability	Decision
1	Presentation of subject matter	3.22	4.07	0.27	0.18	14	11.90	0.00	S*
2	Classroom control and management	3.09	3.65	0.18	0.16	9	8.51	0.00	S*
3	Overall performance	3.16	3.91	0.24	0.27	48	10.14	0.00	S*

Sf = degree of freedom

Sd = Standard deviation

S* = Significant at 0.05 probability level

The result in Table 5 shows that the t – calculated value due to the performance of physics teaching as regards the factors of teaching performances is 10.14 and the probability (0.00) is less than the level of significance (0.05). Since the calculated probability is less than the level of significance, there is significant difference in the performance of the mean rating scores of the physics students due to gender in favour of the female students with higher mean rating scores. Thus, gender influenced the students' ratings of the performances of their physics students in the various items of physics teaching.

Discussion

This research focused on teachers' performances in physics classroom teaching in secondary schools. Research question one and research question two aimed at finding out the extent of performances in physics teaching in the various aspects of presentation of subject matter and classroom control and management. In both factors, the physics teachers performed to a very great extent in the students mean response ratings. The students rated the Physics Teacher performance to a very great extent in all the

various aspects of the teacher performances in the Teaching Practice Assessment Test examined. The students however rated the physics teacher performance higher on presentation of subject matter than on classroom control and management. This is in line with the result of the study of Ugwu D and Ugwu G (2015) who found out that Economics teachers in Enugu North Local Government Area performed to a very great extent in all the activities of teaching behaviours as regards the contrails presentation of subject matter, class control and personality characteristics. This result also is in agreement with the findings of Stokking and Verloop (2006) on students' assessment of economics teachers. The students rated their economic teacher behaviour to be of good performance. The result of an investigation on the effectiveness of physics teaching in Italy carried out by Cinquini, Robutti, Vincenzi and Violino (1996) is in agreement with the findings of this result also. The findings show that physics teaching as seen by the student is not generally a negative one. The unhappy students do not exceed 27% of the whole sample and 66% feel at ease during lesson and 50% like the subject. According to them, when compared with similar investigations carried out by Vincenzi 1985 whose results revealed that physics teachers seems to be less sensitive to problems within the class but physics teaching is acknowledged as stimulating reasoning. The finding also agrees Anyanwu (2001), who found that religious education teachers performed to a great extent in all the activities of the constructs studied which includes lesson plan, teacher presentation of subject matter, evaluation, class control, personality characteristics and religion characteristics.

Furthermore, it is worthy of note that all the students agree that the physics teachers performed to a very great extent on all the various items of performances in the TPAT. It is therefore, expected that the students should reciprocate this very great performances of their teachers with a corresponding very great extent performance in their academic work and achievement in examinations.

Again, research question three aimed at finding out the mean response ratings of male and female physics students as regards the performances of the physics teachers' in the various aspects of teaching practice assessment test.

The result of the analysis revealed that male and female students digger in the mean response ratings. The mean response rating of female students is higher than that of the male students. This finding is revealing though not surprising because female students are known to be by nature more emotional than the male ones and this difference may have accounted for the observed differences in the ratings of the students (Ugwu D and Ugwu G, 2015). Anyanwu (2001) observed that male students are confident, tough and unemotional in character. Hence, these traits may account for their being less liberal in awarding marks to their teachers.

The hypothesis tested sought to ascertain if there exists a significant difference ($P < 0.05$) in the mean response ratings of the physics students in the factors of performances of physics teachings in TPAT due to gender. The analysis of the result show that male and female physics students differ significantly at 0.05 level of significance. This result agrees with that of Ekpo as reported in Anyanwu (2001) that teacher sex affect the ways in which teachers react to curriculum. However, the present result differ from Anyanwus' finding which showed that male and female religious education teachers do not differ significantly as regards each of the factors studied.

Conclusion

It could be deduced from the analysis of the results and findings that the physics teachers in Owerri Education Zone are doing well in their performances of physics teaching in the classroom. This means that they teach the subject satisfactorily to the students. This implies also that they are well acquainted with the physics curriculum. It could also be deduced from the students' responses that the classroom atmosphere of the school environment is conducive to learning.

Again, the gender significant difference in the mean response ratings of the students shows that the students are examining the performance of the physics teaching from different perspective.

Furthermore, the significant difference in favours of the female students is an indication that the female students are more positively disposed to their physics teacher. It is hoped that the positive disposition will

help to attract more female students to the course. When that happens, both the student's enrolment and performance are expected to improve.

Recommendations

To sustain the good performance, physics teachers are encouraged to attend periodic seminars and workshops in this regard.

Supervision and inspection of physics teachers' performances in classroom teaching and learning should be a regular exercise by the ministry of education.

Stakeholders in physics education should in order to sustain the trend ensure that only qualified and experienced physics teachers with high intellectual abilities are always recruited to teach physics.

To support the teachers, it is imperative that this result should be made known to them to help diagnose areas of strength and weaknesses.

Reports of the students' assessment of the teaching performances of their teachers should be incorporated into the instruments of evaluation of teachers during monitoring and supervision of their teaching by the ministry of education.

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