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AN INVESTIGATION INTO STUDENTS' PERFORMANCE IN SENIOR SECONDARY SCHOOL PHYSICS IN OGBOMOSO METROPOLIS

BY

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ABSTRACT

The aim of this study was to investigate the students' performance in Senior Secondary Schools physics. Three secondary Schools were randomly sampled from secondary Schools within Ogbomosho metropolis. The Senior Schools Certificate Examinations (SSCE) results of sampled schools for nine years (1999-2007) were used for the data analysis. The results show that the performance in physics examination was deteriorating. One of the recommendations proffered was that the physics teacher should function as facilitators to assist the students to develop positive attitude towards the subject.

Background to the Study

Physics is one of the subjects being taught in senior Secondary Schools in Nigeria. It is found useful in the field of Engineering, Industry, Agriculture and Medicine. The relative importance of physics to the society therefore creates an awareness to develop the interest of positive attitude of the teachers, the learners and the society in the study of the subject. In today's technological breakthrough, the knowledge of physics has led to communication between people by radio, telephone, television and the development of road, water, air, motor vehicles (Abdullahi, 1990).

In Secondary Schools today, the fact remains that the trends in the enrolment and performance of Secondary Schools students in science subject, especially

physics, assume threatening and frightening dimensions. The enrolment is not fully steady in terms of increases over the year but the students' performance is also disturbing. This could be seen in the low level of students' performances in mathematics and the sciences as recorded by the West African Examinations council (WAEC) (2004) and Joint Admissions and Matriculation Board (JAMB) (2007) reports. (Obemeata, 1990, 1991 & 1995); Onwuakpa, 1997 and Uwadiae, 1997).

Aigbomian (1994) and Uguanyi (1994) in their studies observed that there is low enrolment in physics in school and other tertiary institutions in Nigeria despite the desire for technological development. This is a negative trend, an unsatisfactory situation, which can jeopardize the industrial, educational, technological and economic growth of the nation. The low enrolment in physics may be attributed to the belief by students that physics is a difficult subject meant for selected few.

Therefore, to remove frustration in physics learning, it is necessary for teachers to understand which classroom practice and instruction techniques shall make students develop interest in the subject. Adeleye (2000) in his work on "Vocational Education in two Nigerian Secondary Schools", discovered that schools that were involved in practical classes, perform better in the School Certificate Examinations, than those that neglected practical classes. Adeleye stressed the importance of practical work in schools on the grounds that it helps to motivate the students and ensure that their content in the achievement is increased.

Adebayo and Adams' study as quoted by Akanbi (2006), the performance of the pupil in physics in some selected Secondary Schools in Lagos was quite low. They attributed this to the poor way in which physics was taught in most of our schools, as well as pupils' perception of physics as difficult subject. From past studies, it has been noted that various teaching methods have different effect on student achievements.

Also, Uguanyi (1998) in his study compared the influence of guided discovery and chalkboard as a teaching method, for a physics test. After a pre-test, the class was divided into few groups and taught the same topics using different methods. It was discovered that those taught with the guided discovery method perform better than their counterpart who were exposed to didactic method.

Ogamba (2002) found that one obvious source of weakness in students' performances in physics lies in the teaching profession. Teaching has been described as a "sick profession" because it lacks some of the requirements of professional job and this is the root of the falling standard of education and also there is no standardized qualification before one can take to teaching. The condition of science teaching which is generally not of standard, because of this poor condition of service many qualified teachers are enticed by big salaries in other type of employment like the banks, civil service and a host of others. Adelodun (2005) said in her findings that much has been written about teachers in connection with effective teaching.

"Hence, in Nigeria, like elsewhere, teachers are always held accountable for the performance of students in external examination even though not much is known about how teacher classroom behaviour affects performance of students in these examinations" (p. 19). Adelodun further said that a deeper understanding of physics and physics processes could only be achieved through laboratory materials, which encourage active participation and serves to develop critical thinking; they provide concrete experiences to substantiate the theoretical aspect of physics.

Purpose of the Study

The purpose of this study was to evaluate the performance of students in physics at the S.S.C.E level, in order:

- (i) to the general trends in time, how has the performances being in physics for the pass years compared with other two basic sciences
- (ii) to offer some suggestions on how science teaching and learning can be of help to improve students' performance in physics.

Significance of the Study

This study is significant because the outcome of the present study will hopefully be of great help to the school administrator, teachers, students, and the society as a whole. It can be used as a guide to physics teachers and students on how learning can be enhanced in physics. The study could also help to inform school administrator of the area which need to be emphasized at various seminars and workshops, which will, in turn help the students to perform better. It will also enable the society to offer useful advice to learners, physics teachers and curriculum experts for the teaching of the subject.

Methodology

Simple random sampling technique was used in selecting three schools (A, B & C) offering science subjects and presented candidates for Senior Certificate Examination (SSCE) for the past twenty years from schools within Ogbomoso metropolis. The SSCE results in the three basic sciences (Physics, Chemistry and Biology), of these schools for nine years (1999-2007) were critically examined. The results of all the students that offered the three basic science subjects for each year from each school sampled were used for the data analysis.

Analysis of Data

Table 1:

SSCE Physics, Chemistry and Biology Examination Results for Sampled Schools in Ogbomoso (1999-2007) and three year moving average of the % Pass

SCHOOL A

		BIOLOGY			CHEMISTRY			PHYSICS		
Year	Data	Total no	Percentage	Percentage	Moving	Total no	Percentage	Percentage	Moving	
Total	no	Percentage	Percentage	Moving	Moving	Total	Percentage	Percentage	Moving	
Students	Year	of	Passes	Average	Average	of	Passes	Passes	Average	of
	Passes	Students	Average			Students				
1999	1	112	19.6			21	4.8			21
61.9										
2000	2	85	30.6		21.6	24	54.2		33.8	24
58.3	58.6									
2001	3	145	14.5		29.9	33	42.4		59.0	27
55.6	61.9									
2002	4	161	44.7	33.3	46	80.4	67.2	46		71.7
63.7										
2003	5	138	40.6		33.7	33	78.8		60.2	36
63.9	54.5									
2004	6	139	15.8	27.6	28	21.4	43.5	25		28.0
48.9										
2005	7	166	26.5	36.0	33	30.3	35.8	75		54.7
49.0										
2006	8	134	65.7	35.8	45	55.6	39.1	45		64.4
57.8										
2007	9	272	15.1			92	31.5			92
54.3										

SCHOOL B

		BIOLOGY			CHEMISTRY			PHYSICS		
Year	Data	Total no	Percentage	Moving	Moving	Total no	Percentage	Moving		
Total no	Year	of	Passes	Average	Average	of	Passes	Average	of	
Students	Passes	Students	Average		Students					
1999	1	30	53.3		15	53.3			15	
33.3										
2000	2	27	92.6	78.6	7	71.4	41.6	7	71.4	
68.2										
2001	3	20	90.0		69.2	5	0.0	42.5	4	
100.0		85.7								
2002	4	60	25.0	48.3	16	56.3	43.8	14	85.7	
86.9										
2003	5	50	30.0		32.8	20	75.0	56.3	20	
75.0		66.4								
2004	6	92	43.5	43.9	15	37.0	57.5	13	38.5	
58.3										
2005	7	120	87.3	57.2	25	60.0	44.8	26	61.5	
33.0										
2006	8	100	70.0	57.2	27	37.7	46.8	30	-	
45.8										
2007	9	150	43.3		30	43.3			29	
75.9										

SCHOOL C

Year	Data	BIOLOGY			CHEMISTRY		PHYSICS		
		Total no	Percentage	Moving	Total no	Percentage	Moving	Total no	Percentage
	Year	of	Passes	Average	Average	of	Passes	Average	of
	Passes	Students			Students			Students	
1999	1	25	16.0		10	60.0		10	
20.0									
2000	2	40	30.0	35.7	11	27.3	58.3	11	72.7
54.2									
2001	3	54	61.1	41.3	8	87.5	49.4	10	
70.0	60.4								
2002	4	70	32.9	49.9	15	33.3	60.3	13	38.5
48.7									
2003	5	120	55.8	50.8	20	60.0	45.5	16	
37.5	52.0								
2004	6	130	30.8	50.3	30	43.3	40.2	20	80.0
52.5									
2005	7	90	64.4	56.7	23	17.4	46.3	25	40.0
65.6									
2006	8	100	75.0	59.8	32	78.1	43.5	30	76.7
55.6									
2007	9	150	40.0		20	35.0		20	
50.0									

Source: Computed SSCE results from the secondary school in Ogbomoso metropolis

Table 2:

Computation of Coefficient of regression of students' performance in physics with years

		School A				School B				School C			
Year	Data	%	Y	X	XY	%	Y	X	XY	%	Y		
X	XY												
Pass	Year	Pass	Y-Y	X-X			Pass	Y-Y	X-X				
	Y-Y												
	X	Y											
1999	1	61.9	4.9	-4	-19.6	33.3	-26.8	-4	107.2	20	-33.9		
-4	135.6												
2000	2	58.3	1.3	3	-3.9	71.4	11.3	-3	-33.9	72.7	18.8	-3	
-56.4													
2001	3	55.6	-1.4	-2	2.8	100	39.9	-2	-79.8	70.0	16.1	-2	
-32.2													
2002	4	71.7	14.7	-1	-14.7	85.7	25.6	-1	-25.6	38.5	-15.4	-1	
15.4													
2003	5	63.9	6.9	0	0	78	-21.6	0	0	37.5	16.4	0	
0													
2004	6	28.0	-2.9	1	-2.9	38.5	1.4	1	-21.6	80.0	26.1	1	
26.1													
2005	7	54.7	-2.3	2	-4.6	61.5	-60.1	2	22.8	40.0	-13.9	2	
-27.8													
2006	8	64.4	7.4	3	22.2	0	15.8	3	180.3	76.7	22.8	3	
68.4													
2007	9	54.3	-2.7	4	-10.8	75.9		4	63.2	50.0	-3.9	4	
-15.6													

Σ
113.5

-47.8

-168

Equation of coefficient of regression line for physics in school A is given by

$$Y - Y = \Sigma [(X - X)(Y - Y)] (X - X)$$

$$Y - 57.0 = -47.8 (X - 5)$$

$$= -47.8X - 5X - 47.8$$

$$= -47.8X + 239.0$$

$$Y = -47.8X + 239.0 + 57.0$$

$$Y = -47.8X + 296.0$$

Coefficient of regression is -47.8

The same was done for other coefficients, to obtain the result as shown in Table 3

Table 3:

Comparison of coefficient of regression for the three schools

	School A	School B	School C	Average	Rating	
Biology	82.4	-152.7	235.5	55.07	1	
Chemistry	27.3	-42	-77.8	-30.67	2	
Physics	-47.8	-168	113.5	-34.1	3	

It can be seen that the coefficient of regression for all the basic sciences in school B shows a negative trend while in schools A and C only Physics and Chemistry were negative. Therefore the performance of students in sciences subjects in school B is deteriorating.

Discussion

The comparison of coefficient of regression on Table 3 shows that performance in physics is the worst when compare with the other two basic sciences. There was a drastic fall in the percentage among all the three basic sciences in school A in 2004, school B in 2002 and school C in 2004 respectively. However there was a declined in school B in 2003 and 2004.

Conclusion

The result of the study shows that there was a drastic fall in the performance of students in physics education as indicated in Table 1 above. The coefficient of regression of the linear model showed that the three schools used for the study attained an average performance in the science subjects except in school B where the result reflected a negative trend.

Recommendations

The following recommendations have been made as part of the measures that could facilitate the performance of the physics students.

1. Physics teacher should function as a facilitator, encourage, helper, and assister to help the students develop positive feeling about the subject.
2. The teacher must grasp the Knowledge of the concepts taught and relate them to the students' interest, environment and basic needs.
3. The teacher should use a teaching method that will be practical and activity-packed to be meaningful to students.
4. The teacher should select the right method and familiar examples that will give the students that desired experience.
5. The teacher should present the lesson in an interesting manner to give the students some fun, his basic needs must be used as an example either for introducing the lesson or for illustrating points at the presentation of the lesson e.g. pulley, friction.

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