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Perception of Students on Causes of Poor Performance in Chemistry in External Examinations in Umuahia North Local Government of Abia State

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Abstract

The aim of this study was to investigate the perception of students on the causes of their poor performance in external chemistry examinations in Umuahia North Local Government Area of Abia State. Descriptive survey design was used for the study. Two hundred and forty (240) students were selected through simple random sampling for the study. A self-constructed questionnaire titled investigation of Perceived Causes of Poor Performance of Students in Chemistry was used to collect data. Three research questions and two hypotheses guided the study. Descriptive statistics, including frequency, percentage and mean as well as Pearson Product moment correlation was used. The findings revealed that teachers' poor qualification, poor method of teaching, lack of teaching experience, and failing to use the instructional materials were some of the perceived causes of students' poor performance. Based on the findings, it was recommended that attempts should be made by the government and private school proprietors to ensure that qualified and experienced teachers should be recruited for the Senior Secondary Schools in the area. In addition, teachers are implored to teach with adequate teaching aids and instructional materials, when they are available, to improve their methods of teaching and where they are not available the government and private proprietors' of schools should endeavor to purchase instructional materials for the teachers' use in schools.

Keywords: Perceptions, Causes, Poor performance, Chemistry, External examination

1. Introduction

One of the major issues that bothers students in Nigeria today is their academic performance (Ojukwu, 1994). Poor academic performance of students in internal and external examinations is a reflection of the problems and challenges facing the educational system in Nigeria today (Fehintola, 2009).

Education helps individuals to adopt to a new environment. In Nigeria, education is seen as the only means of getting to the top hierarchy in any endeavor. Thus, poor academic performance usually brings about sadness and frustration to the individual concerned and to his/her parents as well as other members of the family. As a matter of fact, it gives parents and students feelings of satisfaction and joy when children excel academically (Fehintola, 2009).

To this end, the importance attached to good academic success or performance by the students as well as their parents and the difficulty experienced by these students have resulted in wide-spread failures, low grades, examination malpractices, cheating, and so on. These are the cases with the students taking the Senior Secondary Certificate Examination (SSCE) of the West African Examination Council (WAEC) and National Examination Council (NECO) (Ojukwu, 1994).

There has been wide cry each year when WAEC or NECO releases their annual results as a result of students poor performance especially in the Science subjects (Salami, Mohammed, & Ogunlade; 2012). Candidates' performance at the Senior School Certificate Examination (SSCE) conducted by WAEC and NECO has consistently remained poor with Chemistry having one of the worst and poorest results over the years (Ibe & Madusnum, 2001). For example, a look at the five-year SSCE results in Chemistry from 2010 to 2014 shows that in 2010 out of 105,453 that sat for Chemistry in all the secondary schools in Abia State only 26,680 credited Chemistry. This means that only about one in four students can use Chemistry as one of the subjects that would qualify them for University admission. Yet, chemistry is a prerequisite to all courses in medicine and related field, all engineering courses, pharmacy, and many others that are considered prestigious by the society. This means that there will be a low number of admissions in them, which will certainly affect the development of the country. The rest of the results are displayed in Table 1:

Table 1. Chemistry WAEC Results (2010-2014) In Abia State Secondary Schools (WAEC REF. RD-19/NEC/VO/1/492)

Years	No. of Candidates	A1 – C6	D7 – E8	F9
2010	105453	26680 (25:48)	57245 (52:12)	48204 (54:67)
2011	107781	40506 (37:37	30049 (38:10	36716 (34:39)
2012	115549	35095 (32:04)	25874 (24:34)	35729 (35:05)
2013	916781	28852 (24:97)	23550 (20:28)	52571 (47:14)
2014	126401	26031 (23:55)	25750 (22:01)	56534 (49:84)

There appear to be certain causes for the massive failure in Chemistry at the West African Examination Council (WAEC) and National Examination Councils' Examinations. Such causes could include lack of knowledge of common subjects, inadequate coverage of the syllabus and unfamiliarity with test format. Others may include lack of strong reading spirit in the candidates who prepare for the examinations, poor study habits, and psychological adjustment problems. Also included are lack of interest in school programme, low retention and association with wrong peers as well as low achievement motivation and emotional problems. There are also teachers and teacher-related problems as well as institutional and government-related problems, not to mention the families, home and parent-related problems.

1.1 Statement of the problem

Considerable attempts have been made at researching on some of the variables above but none has focused on what the students themselves perceived as factors that cause poor performance in chemistry. Researchers have so far focused on teacher-related problems in the teaching of science subjects (Spain, 1971; Ajagun, 2000, Usman, 2003; Adebale, 2004). Other identified factors of poor academic performance are motivational orientation, self-esteem/self-efficacy, emotional problems, study habits, and poor interpersonal relationships, among others (Aremu & Sokan 2003). The role of instructional material, methods, practicals, and the like on the academic performance were also studied by Nnaka and Anaekwe (2004).

Given the wide ranging effects of students' poor academic performance and its concomitant social and destructive emotional effects on the students, parents, society and the nation, it is appropriate and should be a welcome development to explore what students actually perceive as factors or reasons for their poor performance at the external examinations conducted by WAEC and NECO. This will enable proffering of solutions for a better performance by students.

Following from the above and given the fact that the factors suspected to be some of the reasons why students' performance in Chemistry continued to decline, this study's main motivation was to investigate what the students perceive to be the causes of their poor performance in Chemistry at both May/June and November/December examinations.

1.2 Objectives

The objectives of the study were to determine:

1. the perceived causes of poor performance in Chemistry;
2. if the teachers teaching methods/strategies have effect on the students' academic performance in Chemistry;
3. the methods/strategies to be adopted to improve students' performance in chemistry in the Senior Secondary School Certificate Examination;
4. if the teachers use of instructional materials have any effect on the academic performance of the students;
5. if perception of poor performance is more pronounced in public or private schools; and
6. if gender has effect on the perception of students' poor performance in chemistry.

1.3 Research Questions

The following research questions were raised to guide the study:///

1. What are the perceived causes of students' poor performance in Chemistry?
2. Has gender any effect on the perception of students' poor performance in chemistry?
3. What are the methods/Strategies to improve students' Performance in Chemistry in Senior Secondary School Certificate?
4. Does gender affect academic performance of students in chemistry?

1.4 Null Hypotheses

1. There is no significant difference in the perceived causes of poor performance in Chemistry between students in Private and Public Schools.

2. There is no significant relationship between teachers' use of instructional materials and students performance.

2. Method

The research design adopted in this study was a simple descriptive survey design. The targeted population were all the senior Secondary School Students' in Umuahia North Local Government Area of Abia State who offered Chemistry as one of their examination subjects at the Senior Secondary School Certificate examinations conducted by West African Examination Council (WAEC) and National Examination Council (NECO). Six Secondary schools were involved and a total of 240 students participated in the study, 40 students each were drawn from the schools.

Simple random sampling technique was used in the selection of the research subjects in which six (6) secondary schools were selected out of the 21 secondary schools in Umuahia North LGA. Forty (40) students were simple randomly selected from each of the six secondary schools.

For the purpose of the study, the researcher self-constructed and made use of questionnaire tagged "Investigation of perceived causes of poor performance of students in Chemistry at External Examinations" to gather data from the students. The instrument contained thirty-one (31) items which the students were expected to rate.

The instrument was divided into two sections. Section A was designed to obtain students' biographic data. Section B was directed at obtaining information on what the students perceived to be the reasons or causes of their poor performance in chemistry at external examinations. The section elicited among others information on teacher's years of teaching experience and students' academic performance. Students were requested to confirm their teachers' years of teaching experience if they were in doubt.

Others are teacher's use of instructional materials and student's academic performance, gender and students academic performance among others. The instrument was designed using a four-point Likert-type scale with strongly agree, Agree, Disagree and Strongly disagree.

The content validity of the instrument was ascertained by subjecting the instrument to the scrutiny of three test experts in Measurement and evaluation, Guidance and Counseling and Psychology. The experts judged the appropriateness, comprehensiveness and clarity of the items in the questionnaire. Their criticisms and opinions helped to strengthen the face and content validity of the instrument.

In order to determine the reliability of the instrument, it was administered on two groups of Senior Secondary School students offering chemistry in the Umuahia North LGA who were not included in the study. A two week test re-test reliability method was carried out on the sample. The scores obtained were correlated using Persons Product Moment Co-efficient. Correlation coefficient of r=.92 was obtained thus indicating that the instrument was adequate for the study.

The questionnaire was administered in the selected schools by the researcher with the assistance of chemistry teachers in the schools. They were all collected, properly filled and were thereafter scored. The scoring was done by assigning 4, 3, 2 and 1 points to the strongly agree, agree, Disagree and strongly disagree respectively. Academic performance of students in chemistry was sourced from the West African Examination council (WAEC) Abia State office for the past five years.

The data were analyzed using frequency counts, percentages, mean, t-test and Pearson's Product Moment Correlation (r). Mean cut off point was 2.5. All items with mean 2.5 was regarded as agreement and accepted while those with less than 2.5 were regarded as disagreement and rejected. Strongly agree was combined with agree while disagree was combined with strongly disagree for the purpose of analyses.

3. Results

The results and findings of the study are presented below:

Research Question 1. What are the perceived causes of students' poor performance in Chemistry?

To answer this research question frequency percentage, mean and standard deviation of students' perception of the causes of their poor performance was analyzed. The mean cut-off point used was 2.50. All items with mean 2.50 and above was regarded as agreement and accepted while those with less than 2.50 was regarded as disagreement and rejected.

Table 2 shows the frequency percentage of student's perception of the causes of their poor performance. As stated earlier strongly agree and agree were combined to give agree while disagree and strongly disagree were combined to give disagree. Thus 50% was set as bench mark for agree and disagree. In item I, 95% of the respondents agreed while 5.0% disagree that teachers' poor educational qualifications have effect in their teaching as well as students' performance in Chemistry. It was accepted that teachers' educational qualifications has effect on the teachers teaching and this has effect on the students' performance. Other items with positive acceptance and having effect on the students' performance are teachers methods/strategies of teaching 90% as against 10%, teachers use of instructional materials , 75%; teachers years of teaching experience 94.5%. Others are low retention 94.41, Emotional problems 88.8%, inadequate coverage of the chemistry syllabus as well as non-conduct of chemistry practical's, 100% and lastly lack of knowledge of the subject as a result of the subject being difficult 88.8%. Finally, two items poor study habits by the student and lack of interest in the subject with 66.7% and 55.0% respectively disagreed and were therefore rejected.

Table 2. Students' perceptions toward the causes of their poor performance in chemistry

Item	Agree %	Disagree %	Mean	SD	Decision
1. Teachers' poor educational qualification	95	5	3.60	.598	Accepted
2. Teachers' poor methods/strategies of teaching	90	10	3.3	.657	Accepted
3. Teachers' failure to use the instructional materials	75	25	3.15	1.137	Accepted
4. Teachers' years of teaching experience	94.5	5.6	3.33	.594	Accepted
5. Students' poor study habits	33.3	66.7	2.33	.752	Rejected
6. Students' Low retention	94.4	5.6	3.72	.575	Accepted
7. Students' emotional problems	88.8	11.2	3.11	.758	Accepted
8. Students' lack of interest in the subject	45	55	2.35	.104	Rejected
9. Inadequate coverage of the syllabus including failing to conduct the practicals	100	0	3.61	.502	Accepted
10. Difficulty level of the subject	88.8	11.2	3.11	.758	Accepted

Research Question 2. Has gender any effect on the perception of poor performance of students in chemistry?

This research question was tested using t-test analysis (Table 3).

Table 3. Effect of gender on the perception of poor performance of students in chemistry

Gender	N	Mean	SD	t	df	Sig
Male	118	15.833	2.317	.165	238	.320
Female	122	16	1.359			

The results indicated that female students' perception of poor performance (M=16.00, SD=1.359) was slightly more than that of the male (M=15.83, SD= 2.31). However, the t-test results, t(238) = .165, p>.05, showed that gender has no effect on the perception of poor performance of students in chemistry.

Research Question 3: What are the Methods/Strategies to be adopted to improve Students' performance in Chemistry in the Senior Secondary School Certificate examination?

Table 4. Students' perceptions on strategies to be adopted to improve their academic performance in chemistry

Item	Agree %	Disagree %
1. Students' performance in chemistry could be improved by the teacher's method of teaching.	90	10
2. Students who are taught with practical methods perform better in chemistry examinations.	90	10
3. Students who are taught using demonstrations methods perform better.	70	30
4. Students who are taught using lecture methods perform well in chemistry examination.	75	25
5. Students' performance could be improved by the teachers' use of instructional materials.	75	25
6. Most chemistry teachers do not use instructional materials in teaching and this affects students' performance negatively.	55	45
7. Shortage of teaching aids makes teaching and learning less attractive and uninteresting and therefore affects performance negatively.	70	30
8. Use of instructional materials makes students pay more attention to chemistry and improves their performance.	65	35
9. Use of instructional materials in teaching of chemistry helps many students pass their chemistry examination.	75	25

Table 4 shows percentage frequency count of respondents' opinion on the methods and strategies to be adopted to improve students' performance in Chemistry. Accordingly in item I, 90% of the respondents agreed while 10%

disagreed that students' performance in Chemistry is affected by the teachers' method of teaching. In items 2, 90% of the respondents agreed while 10% disagreed that students who are taught by practical methods perform better in Chemistry external examinations. 70% agreed that students who are taught using demonstration method in Chemistry perform well while respondents were undecided on performance of students taught with lecture methods. 75% of the respondents agreed and accepted that students' performance in Chemistry in external examinations is affected by teachers' use of instructional materials and conversely 55% agreed that most chemistry teachers do not use instructional materials and this affects students' performance in Chemistry badly. Also 65% of the respondents agreed and accepted that teaching aids makes teaching and learning attractive and interesting and therefore affects performance positively while 70% of the respondents agreed and accepted that use of instructional materials make students pay more attention to chemistry lessons and hence increase their performance.

H_O1. *There is no significant difference in the perceived causes of poor performance in chemistry between students in private and public schools.*

To test this null hypothesis, t-test was run, the results of which have been summarized in table 5.

Table 5. Comparison of students' performance in private and public schools

School type	N	Mean	SD	T	df	Sig
Public	131	12.66	1.41	1.378	238	.12
Private	109	16.43	1.84			

The t-test revealed a significant difference between the scores of respondents from private and public schools. (Public M=12.66, SD= 1.41), (Private M=16.43, SD=1.84), t(238)=1.378 p<.05). Consequently, the null hypothesis was rejected, thus, it was concluded that there is a significant difference in the perceived causes of poor performance in Chemistry between students in private and public schools.

H_O2: There is no significant relationship between teachers' use of instructional materials/strategies and students performance.

Table 6. Correlation of teachers' use of instructional materials/strategies and students' performance

Variables		Performance
Instructional Materials	Pearson Correlation	.542
	Sig (2-tail)	.032
	N	240

Table 6 shows a Pearson Product Moment Correlation ran to determine relationship between teachers use of instructional materials and students performance in Chemistry. The result show Person Product Moment Correlation Coefficient (r) = 0.542. The observed correlation has a probability level (P value) of 0.032. This significant level of 0. 032 is less than the chosen 0.05 alpha. Therefore the null hypothesis of no significant relationship between teachers' use of instructional materials / strategies and student's performance was rejected and the alternative was accepted. There is a positive correlation between teachers use of instructional materials and students performance in chemistry. The teacher's use of instructional materials improves and enhances students' performance in chemistry.

4. Discussion

The primary aim of this study was to investigate the perceived causes of poor performance of students in Chemistry in external examinations. It was found that the perceived causes of poor performance as per the students opinions were the teachers' educational qualifications, their methods and strategies of teaching, their failing to use of instructional materials and their teaching experience. Other causes include low retention of learned materials by the students, inadequate coverage of the syllabus, non-conduct of practical's and lack of knowledge of the subject matter. These findings support the works of previous researchers who found that teachers' educational qualifications, their teaching methods, use of instructional materials, teachers' years of experience have effect on their teaching and students performance (Usman, 2003; Nnaka and Anakwe 2004).

It could be inferred from the findings of this study that the teaching profession is vastly loosing qualified and experienced teachers to the other professions. What this implies is that teachers of chemistry in the schools are not qualified enough as to impact the required knowledge to the students. Even those who are qualified do not possess the necessary experience and do not make use of adequate teaching aids and materials as to stimulate the interest of the students in the subject hence the poor performance recorded by the students in the external examinations. Besides, inadequate experience and poor qualification of the teachers will result to shallow content mastery and poor delivery and of course the result is known which is abysmal failure especially when the students admitted low retention of

learned materials, and lack of interest in the subject. Some of the students may be those whose parents or peers influenced to choose the subject because of the prestige involved that "I am a science student."

Other findings of this study showed that there is no significant difference between male and female students opinion on the causes of poor performance in chemistry. Of course this finding is not surprising as female students compete effectively with their male counterpart in almost all the professions. These days in our secondary schools and universities. Besides, female students may have been influenced by the performance of some women who have been appointed to prominent position in this country today women have held the position of Governors, senators, ministers Head of service etc. Even outside Nigeria women have been presidents. With the help of information communication Technology (ICT) where the world has become a village, female students could easily read the achievement of the women who have excelled in their chosen professions and would want to model their lives after them. Hence, more determination for hard work and resolve to achieve and excel.

Further findings revealed that there is significant positive relationship between teachers teaching experience and students performance. In effect it implies that with longer teaching experience acquired by the teacher, the better method of teaching and better impact on the students as well as better academic performance.

There is no significant relationship between teachers' use of instructional materials and students performance

Findings on the strategies to be adopted to improve students' performance in chemistry in external examinations showed that teachers should improve on their methods of teaching chemistry. They should teach students and conduct practicals. They should use demonstration methods, instructional aids and materials as these strategies and methods will make the teaching and learning of chemistry attractive, interesting, improve students' performance and would lead to many students passing chemistry in external examinations.

Finally the hypotheses tested showed significant difference in the perceived causes of poor performance in chemistry between students in public and private schools while there was significant relationship between teachers' use of instructional materials and students' performance in Chemistry.

5. Conclusion and Recommendation

The importance of chemistry in choosing professions in Nigeria cannot be underestimated. It is needed in courses like medicine, pharmacy, all engineering courses among others. However, the abysmal performance of students in the subject at the external examination conducted by WAEC and NECO gives concern to parents, students themselves, the society, educational institutions and the government. Hence a study to investigate the perception of students with regard to the causes of their poor performance in the subject. Findings showed the need for more qualified, and experienced teachers who will make use of instructional materials in their teaching of chemistry in the schools. Teachers are therefore implored to teach with adequate teaching aids and instructional materials, improve their methods among others. The problems of students poor performance would be reduced when teachers who are competent and qualified are employed and who also would adopt the use of instructional materials when available and when they are not available government and private school proprietors' should as a matter of policy purchase instructional aids which should be used by the teachers in their teaching of the student. If all these are done they will go a long way in solving the problem of perceived cause of poor performance of students in chemistry.

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