Teacher's Experience and Students' Academic Performances in Secondary School Chemistry Final Examination

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Abstract
The study investigated the teacher's experience and students' performances in secondary school chemistry final examination in Ido Local Government Area Ibadan, Nigeria. The study employed survey research design involving the use of a questionnaire and unstructured interviews. A total of fifty (50) chemistry teachers were drawn from the population as the sample size. The techniques adopted in selecting the sample size was simple random sampling, the instrument used for the data collection was questionnaire. The questionnaires were administered directly to the respondents by hand. Out of fifty questionnaires administered only 45 questionnaires (97%) were returned. Data was analyzed using descriptive, inferential statistics, Anova and regression analysis. Finding showed that there was significant difference between teachers' experience and students' performance in chemistry. And the implication of this finding is that teaching experience improves skills and students learn better at the hands of teachers who have taught them continuously over years. Therefore, it was recommended that experienced teacher should be motivated to be in the profession and also to groom upcoming teachers. Also, supervision and training sections should be provided for teacher, so as to keep them abreast with novelty in teaching of chemistry at secondary schools.

Keywords: Teacher's experience, student's academic performance, teachers pedagogic knowledge, classroom management, Chemistry.

Introduction

Chemistry is known as the study of substances of matter which composed the investigation of their properties and reactions, and the use of such reactions to form new substances. Like every other subject in the sciences, chemistry is the foundation and is the fundamental subject (at Ordinary level) for whatever the student would in his/her further study. In other words, chemistry is the foundation of all disciplines in the sciences ranging from:

i. Medical sciences and pharmaceutical;
ii. Pure and applied sciences e.g. Industrial Chemistry and pure Mathematics;
iii. Biological sciences e.g. Biochemistry and Animal sciences
iv. Sciences and Education e.g. Chemistry and Education, Physics and Education, Biology and Education, Mathematics and Education, Special Education, etc (Ewetan, 2010).

At the senior secondary school certificate examination level, a student interested in any of the disciplines mentioned, must have at least five (5) credits in Mathematics and English Language, Chemistry and any other subjects e.g. (Physics, Biology, Geography, Further Mathematics, etc.).

As a science student, depending on the course the student is interested in studying (at the tertiary level), the student has to take-up science courses which compulsorily include, Chemistry. Several studies have found a positive effect of experience on teachers' effectiveness; specifically, the learning by doing" effect is most obvious in the early years of teaching (Njeru & Oroho, 2003 Rice, 2004; Bauer, 2005; Akinwumi & Odunsi, 2008). Researchers have also given different opinions about teaching experience and students' learning outcomes in schools (Ijaiya, 2000 & Akomolafe, 2001). Their arguments centered on the fact that experience improves teaching skills, while pupils learn better at the hands of teachers who have taught them continuously over a period of years (Ijaiya, 2000). The impact of the teachers in the performance of the students is paramount. The teachers are the facilitators who are to impact on the students the concepts expected to be learnt and the applications of these concepts in solving questions in examination.

As stipulated in the Nigeria National Policy on Education (2004), Chemistry teaching at the secondary schools is meant to develop essential scientific skills in the learners so as to prepare them for technological development in order to stimulate and enhance creativity in them. The issue of professionalism in teaching has been on course for quite some decades ago. Scholars argued the necessity of skilled teachers for effective learning. Ngada (1982) in Fajonyomi (2007) emphasized that the success or failure of any educational programme rests majorly on the adequate availability of qualified (professional), competent and dedicated teachers. Seweje and Jegede (2005) noted that the ability of a teacher to teach is not derived only from one's academic background but it is based upon outstanding pedagogical skill acquired through experience. Passing knowledge to the learners, high-quality teachers are the key components in successful classrooms teaching and learning settings.

According to Adeyemi (2010), teachers play an important role in determining the students' academic achievement. Researchers have never reached a consensus on the specific teacher factors that influence students academic achievement (Rivkin, Hanushek&Kain, 2005). Some studies found that teachers' experience and educational qualifications significantly influenced students' academic achievement (Njeru and Orodho, 2003; Ankomah, Koomson, Bosu&Oduro 2005; Ugbe&Agim, 2009; Asikhia, 2010; Yala and Wanjohi, 2011; Olaleye, 2011).

The controversy over the falling standards of education in Nigeria has been on the front burner of national discourse over the past decades and it is apparent that the debates will continue for some time to come. Poor academic performance has been linked to several factors which include high teacher-student ratio, shortage of good teaching staff, poor quality of educational leadership, political instability and politicization of educational programmes, automatic promotion, age of the learners, and inadequate essential physical facilities and equipment, proper pedagogic training, knowledge of

subject matter, teaching delivery and instructional procedure and materials, teacher's relationship with students, and colleagues. Others include teacher's attitude to work, teacher's job satisfaction, etc are all factors that influence teaching experience and student's academic performance. (Akinwunmi & Odunsi, 2008; Ewetan, 2010).Consequent upon the observed deterioration in the academic performance of students in public secondary schools one wonders if the high failure rates and the poor quality of the students is not a reflection of teachers' experience. In other words, the teachers' experience in classroom interaction with the students could be responsible for the observed poor performance of students and the widely acclaimed fallen standard of education in Nigeria.

It has been discovered that Chemistry contributes to quality of life and nation building in all aspects. It was based on this fact that the Federal Government through her National Policy on Education made Chemistry a compulsory science subject at the secondary school for all science students (FRN, 2004). Eke (2008), accepted that any nation aspiring to be scientifically and technologically developed must have adequate level of Chemistry education. These lead chemists in 2008 to declare "what on earth is not chemistry"**.** However, there have not been remarkable improvements in students' performance in both internal and external (WAEC, 2012) examinations. This fact is captured in the results of student performance in Chemistry in external examination (WAEC) over the year as shown on table 1.

Table 1: Trends in Students' Performances in Chemistry.

Year	Total entry	Total sat	A1-C6	P7-P8	F9
2008	389,462	298072 93.04%	578061 8.04%	69319 21.63%	170947 53.36%
2009	432,230	382024 92.07%	47803 24.18%	44784 22.65%	78773 39.84%
2010	520,345	415757 96.18%	43348 37.02%	29549 24.55%	42860 35.14%

Source: Research Unit, WAEC Board, (2012).

Chemistry teachers however in teaching the subject play an important role and therefore have a strong influence on the student learning of the subject. The qualification, commitment, motivation, experience and instructional styles of the teacher will therefore influence the learner's performances in Chemistry.Adeyemi (2008) found that teachers' years of teaching experience has a significant influence on students learning outcomes in the secondary schools in Ondo State, Nigeria. The result of their chi-square test, correlation analysis, and t-test statistic revealed that teachers‟ teaching experience was significantly related to students‟ learning outcomes.

Abuseyi (2001) examined student and teacher related variables as determinants of secondary school student academic achievement in Chemistry in Epe and Ibeju-Lekki Local Government Areas of Lagos State, Nigeria, using questionnaire, and adopted an ex-post facto design. The author found that teacher age, teacher gender, qualifications, and experience had direct causal effect on students" achievement in Chemistry. The influence of teachers' teaching experiences can be measured on the learning outcome of students as a result of their academic performance. In view of the foregoing, this study seeks to examine the relationship between teacher experience, and student performance in Chemistry in Ido Local Government Areas in Oyo State, Nigeria.

Statement of the Problem

A research interrogation with science (Chemistry) students in secondary schools revealed that, they have difficulty in understanding inexperienced teachers. Also over the years, as classroom Chemistry teachers, it has been discovered that wealth of experience contributed to knowledge delivery to the learners. The influence of teachers' teaching experiences on the learning outcome of students as measured by students' academic performance has been the subject of several studies (Adediwura &Tayo 2007). Achimugu (2016), also discovered that the problem many chemistry teachers faced is the lack of enough effort into the activities of teaching and learning so as to get the best out of the teaching profession also Okpala (2006) observed that to be experienced in teaching, the teacher has to be multifaceted; a source of information and a guide, an organizer of opportunity for learning, someone who can structure a suitable environment for learning and a consultant and Nwachukwu (2009) observed that teacher's way of thinking and belief guides his/her behaviour and decisions inside the classroom which structure also into their experience. This has prompted the researchers to look into the impact of teachers' experience and students' academic performance in Chemistry in secondary schools.

Objective of the Study

The study sought to achieve the following objective.

i. To examine how teachers' years of experience in teaching Chemistry in secondary schools influence student's academic performance in Chemistry in Ido Local Government Area Ibadan, Nigeria.

Research Question

i. How do teacher's years of experience in teaching Chemistry influence students' academic performance in Chemistry in Ido LGA of Ibadan, Nigeria?

Hypothesis

i. Teacher's years of teaching experience does not significantly influence student's academic performance in Chemistry in Secondary schools in Ido LGA of Ibadan, Nigeria.

Methodology

The study employed a survey research design involving the use of a questionnaire and unstructured interviews. A total of forty-five (45) Chemistry teachers were drawn from the population as the sample size. The technique adopted in selecting the sample was the simple random sampling. The instrument used for data collection was a 26 items structured questionnaire. The questionnaires were administered directly to the respondents by hand.

Out of fifty questionnaires administered only 45 questionnaires (97%) were returned. Data was analyzed using descriptive, inferential statistics, Anova and regression analysis. The hypothesis was tested at the 0.05 significance level.

Table 2: Teachers Years of teaching experiences in Teaching Chemistry and student's academic performance in Chemistry

Years of experience	Frequency	Percentage	Cumulative percentage
Below 5 Years	15	33.3	33.3
Between 5-9 Years	12	26.7	60.0
Between 10-15 years	8	17.8	77.8
Above 16 years	10	22.2	100.0

Table 3: Analysis of Variance of Responses on Teachers' years of teaching experience and students' academic performance in Chemistry in Ido LGA Performance

Source	SS	Df	MS	F	Sig. at 0.005
Corrected Model	512.12	2	22.63	5.31	.000
Intercept	14231.24	1	1424.24	674.52	.000
Performance	261.90	1	261.90	6.01	.002
Experience	369.15	1	184.58	8.51	.002
Inexperience	531.74	1	265.87	3.74	.003
Error	1633.00	39	48.74		
Total	322134.34	45			
Corrected total	2795.79	44			
R-Squared= .524					

Table 2 shows that 15 teachers (33.3%) of the 45 sampled had below 5years teaching experience. Another 12 teachers (26.7%) had between 5-9years of teaching experience while 8(17.8%) had between 10 to 15years teaching experience. The remaining 10 teachers (22.2%) had above 16years teaching experience. Thus, from the sample size of 45 a total of 27 teachers (60.0%) had below 10 years teaching experience while a total of 18 teachers (40.0%) had above 10 years teaching experience. This implies that the sample size is dominated by teachers with less than 10 years teaching experience.

With respect to hypothesis 1, the result in table 3 shows that the p-value .003 is lesser than the alpha level .05. The null hypothesis is not accepted. This implied that there is significant difference in the mean performance of chemistry students taught by experience teachers and those taught by inexperience teachers. Table 3 also showed a regression squared of .524 This implied that 52.4% of the students' performance in chemistry can be associated to teachers experiences in teaching.

Hypothesis One: There is no significant difference in teachers' years of teaching experience (input) and student's academic performance in Chemistry.

Table 4: Teachers' years of teaching experiences and student's academic performance in Chemistry

Years	Source	F-Value	Df	Significant
Below 5years	Experience	13.463	3	1.362
	input	7.438	2	0.006
	Experience Input	4.098	1	0.017
5-9 years	Experience	4.213	3	0.005
	Input	0.580	1	0.447
	Experience Input	9.794	2	0.645
10-15 Years	Experience	7.336	3	0.053
	Input	4.398	1	0.036
	Experience Input	3.406	2	0.125
16 years and above	Experience	5.556	3	0.000
	Input	0.608	1	0.435
	Experience Input	15.195	2	1.229

The results of the ANOVAs on teachers' experiences and input scores are presented in Table 4. There was a significant difference in mean scores based on the interaction between years of experience and teacher input. Thus, the hypothesis was rejected. In other words, there is significant difference in teachers' years of input and their experiences in teaching chemistry.

Discussion of Findings

In the above, the analysis of data in respect of the teacher's experience and students' performances in secondary school chemistry final examination was made. Result in table 2 showed that there was significant main effect of teacher's experience and students mean performance in chemistry. The reason for this could be linked with the fact that teachers' experience had direct impact on students' performance. This result is consistent with Abuseyi (2001) who stated that teachers experience had direct causal effect on students" achievement in Chemistry. Also, this finding confirms Chhinh and Tabata (2003), Abu and Fabunmi (2005), Adeyemi & Akinsolu (2010), who found that teachers" teaching experience correlated significantly and positively with students" academic performance.

The result also shows that the value for F is significant at α 0.05 hence the rejection of the research question. The finding agrees with Hemp (2009) and Jones (2011) who found that students tend to achieve better results when taught by teachers with more years of teaching experience. However the finding disagrees with Walt (2012) who reported no significant difference between teachers with teaching experience and teachers without teaching experience in relation to learning outcomes.

Results also show that there is significant difference in the mean performance of chemistry students taught by experience teachers. This may be due to the wealth of knowledge the teachers have acquired over years. It could also be attributed to exposure to the students writing final e xams and acquaintance of Chemistry final for secondary school students. The finding was however consistent with that of Adeyemi (2008) who examined teachers' teaching experience and students learning outcomes and discovered that teachers" teaching experience was significantly related to students learning outcomes. Also teaching experience contributed significantly to the quality of chemistry education compared to their less experienced counterparts. This may be attributed to constant interaction with students over the years, as they bring commitment to bear on their teaching experience. It could also be that experienced teachers brought novel practices, such as, creativity and new ideas into chemistry teaching.

Table 4 further indicated that teachers' experiences and input were significant to students' performance in Chemistry. The implication of this finding is that teaching experience improves skills and students learn better at the hands of teachers who have taught them continuously over years. However, the findings of this study were in line with the findings of studies done by other scholars who found that teachers' experience plays a crucial role in determining the students' academic performance (Njeru and Orodho, 2003; Ankomah 2005; Asikhia, 2010; Yala and Wanjohi, 2011; Olaleye, 2011; Maguswi, 2011).

Conclusion

The study sought to find out the effect of teacher's experience and students' performances in secondary school chemistry final examination in Ido Local Government Area Ibadan, Nigeria. It made use of 45 teachers who were selected using simple random sampling method. Taking into account the findings of this study, it was concluded that teaching experience is vital in students' learning outcomes in secondary schools in Ido Government Area Ibadan, Nigeria. Facts from the findings have led the researcher to conclude that inexperienced teachers formed the bulk of the teaching personnel in secondary schools in the State. The study also concluded that teacher's experience does significantly influence the students' academic performance in Chemistry final examination. Thus, teachers that have acquired more years of experience in teaching Chemistry are needed to take students writing their final examination.

Recommendations

Based on the findings of this study the following recommendations are made to improve the academic performance of students in Chemistry.

i. Teachers with more years of experience should be motivated to stay in their jobs so as to teach students writing their final exams in Chemistry.
ii. Fresh teachers should be mentored by the older ones and opportunities should be given to them to learn from other means.
iii. Workshops, seminar, in-service, refresher courses, exhibition, scholarship and other means whereby Chemistry teachers can learn should be granted to them.

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