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INFLUENCE OF TEACHERS' COMPETENCE ON STUDENTS ACADEMIC PERFORMANCE IN SENIOR SECONDARY SCHOOL CHEMISTRY

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ABSTRACT

This study investigated the influence of teachers' competence on students; academic performance in senior secondary school chemistry. A random sampling technique was used to select 6 secondary schools out of 12 secondary schools in Yala Local Government Area of Cross River State. 200 students, 20 teachers and 6 principals were used in the study. A survey design was adopted for the study. Three researcher – made instruments namely School Principal Questionnaire (SPQ), Teachers Competence Questionnaire (TCQ) and Chemistry Achievement Test (CAT) were used to gather data for the study. Data were analyzed using the Pearson Product Moment Correlation (PPMC) and t-test. Results revealed that there is significant relationship between teachers' competence and students' academic performance in Chemistry. Chemistry students taught by qualified teachers performed significantly better than those taught by unqualified teachers. Also chemistry students taught by experienced teachers performed significantly better than those taught by inexperienced teachers. Recommendations were made on how to promote further development of science teachers in Nigeria.

KEYWORDS: influence, qualification, experience, teachers' competence, academic performance.

INTRODUCTION

The provisions of the National Policy on Education for teacher education includes the purpose of teacher education, institutions of training professional teachers and their entry qualifications, curriculum of Teachers' Colleges and Professionalization of teaching. Effective learning in schools would require effective teaching to accompany the efforts of the learners. Teacher competence needs to be very high in order for meaningful teaching and learning to take place (Segun, 1986).

At the secondary school level where a distinction has been made between Junior Secondary School (JSS) and Senior Secondary School (SSS) curricula, teacher competencies for each level and appropriate subjects would vary as well. In order to ascertain what these competencies are, the JSS and SSS programmes need to be examined in the context of the preparation of the teachers that would implement these programmes. Their competencies must therefore relate to academic and professional preparation, professional growth, classroom interaction and evaluation (Macaulay, 1986).

The professional chemistry teacher is expected to possess certain competence both professional and personal. Professional competences are both academic and pedagogical. Academic competencies are the teacher's knowledge of his subject. Pedagogical competency is the art of teaching the subject, observing such principles as teaching from known to unknown, concrete to abstract and from simple to complex (Akpan, 2002).

The chemistry teacher's success in the classroom depends very much on his preparedness for the instruction process. It has been observed that the present chemistry teachers in secondary schools are not

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professional chemistry teachers or has any of them even undergone a teacher training programme, sometimes, those who teach chemistry are graduates of pure physical sciences like chemistry, engineering and sometimes Biochemistry. And of course, many of these teachers are not education graduates (Onwioduokit & Ikwa, 2000). It is to be noted that the teacher is the main aid to learning, his methods, styles and techniques being additional aids. Where a teacher is deficient in a particular topic, the tendency is to doge the areas of deficiency while the learner is bound to suffer. Keegan (1996) affirmed that a beautiful building and expensive equipment, stocked in, will not lead to effective learning without the qualified teacher putting them into use and making students to participate in the experimental procedures.

What is then needed to be a competent chemistry teacher? A competent chemistry teacher is a person who is professionally qualified and trained to teach chemistry, having the necessary qualities or skills and showing adequate skills in the teaching process, (Osaat, 2004). Other competencies required of teachers include knowledge of subject-matter, pedagogy, skill processes, resourcefulness, behaviour motivation and evaluation (Ivowi, 1986a). A competent chemistry teacher attends conferences, workshops and seminars, has a good classroom control, effective communicative skills, adequate knowledge of the subject, utilize a variety of teaching methods, or strategies and show enthusiasm for teaching (Akinbobola, 2004).

Statement of the problem

Teachers' primary role of transmission of knowledge and skills is never in dispute. Therefore a teacher would need to demonstrate efficiency in this primary role. Indeed teachers' academic background, training and professional competence is at stake here Ivowi (1986). There is deficiency and poor academic performance of students in sciences (chemistry) and this could be traced to lack of teachers' competence and learning resources in our classrooms (Nwosu, 2000). It also has been observed that the present state of Chemistry teaching in Nigeria indicates that many people who teach chemistry in secondary schools are not professional chemistry teachers (Inyang, 1993). This might be one of the reasons for the poor performance of students in the subject. Thus, the questions which chemistry teachers should ask themselves include: Do I have the academic and professional competencies to enable me teach the content meaningfully? Do I have the mastery and skills to carry out the evaluation based on the evaluation procedures? This study therefore aims at investigating the influence of teacher's competence and students' performance in chemistry.

Purpose of the study

The study aims at achieving the following objectives:

1. To investigate the influence of teachers competence on students' academic performance in chemistry.
2. To examine the influence of teachers' qualification on the academic performance of students in chemistry.
3. To determine the influence of teachers' experience on the academic performance of students in chemistry.

Research hypotheses

The following hypotheses were formulated to guide the study.

HO_1: There is no significant relationship between teachers' competence and students' academic performance in chemistry.

HO_2: There is no significant difference between the academic performance of chemistry students taught by qualified teachers and those taught by unqualified teachers.

HO_3: There is no significant difference between the academic performance of chemistry students taught by experience teachers and those taught by inexperienced teachers.

RESEARCH METHOD AND MATERIALS

Design of the study

The research adopted a survey design for the study.

Sample and sampling techniques

The population consisted of all chemistry teachers, principals and all SS 2 students in Yala Local Government Area of Cross River State. The size of the population was 480 chemistry students, 25 chemistry teachers and 12 principals from 12 secondary schools. A sample of 200 chemistry students from six schools using intact classes were used. Also 20 teachers and 6

principals were randomly selected for the study through random sampling technique.

Instrument and validation

Three researcher-made instruments were used for the study. They comprised, a researcher designed chemistry Academic Test (CAT), School Principal Questionnaire (SPQ) and Teachers Competence Questionnaire (TCQ). The Chemistry Achievement Test (CAT) comprised 25 – multiple choice items on the concepts of chemistry bonding. Each item had four options with only one correct answer. Each correct answer was scored 4 marks. The school principal questionnaire (SPQ) elicited information on Chemistry teacher's personal data on gender, qualification, experience and classes taught by each chemistry teacher.

The teachers' competence questionnaire (TCQ) was a 25 – item questionnaire measured on a 4 – point rating scale of Strongly Agree (SA), Agree (A), Disagreed (D) and Strongly Disagreed (SD). The TCQ was based on teacher's resourcefulness, classroom management, utilization of variety of teaching methods, regular attendance to classroom teaching, evaluation process and utilization of instructional materials. The TCQ was scored using a score range of four (4) for Strongly Agree (SA) to one (1) for Strongly Disagree (SD) for positive items and the scoring was reversed for negative items. The instruments were face validated by Chemistry experts and educationists. Reliability of CAT was determined using Kuder – Richardson formular - 21. A reliability index of 0.84 was obtained. Also the reliability of (TCQ) was determined using Cronbach alpha and the results showed a reliability coefficient of 0.88.

Data collection procedure

Data on teacher qualification(s) and experience were obtained from the school Principal Questionnaire (SPQ) which was administered to each principal of the school sampled. In terms of qualification, teachers were classified into two namely professionally qualified and non-professional qualified teachers. Professionally qualified teachers possess either the Nigerian Certificate of Education (NCE) in Chemistry, the Bachelor of Science Education Degree (B.Sc.Ed.) in Chemistry or Bachelor of Science Degree (B.Sc.) in chemistry plus Post Graduate Diploma in Education (P.G.D.E.). Non professionally qualified teachers are those without any teaching qualification i.e. without the NCE, B.Sc.Ed. Chemistry or the B.Sc. Chemistry plus the PGDE. Experienced teachers have at least five years teaching experience and inexperienced teachers has less than five years teaching experience or no experience in the teaching of chemistry.

The CAT and TCQ were administered to the Chemistry students through the help of research assistants in all the schools selected for the study. The subjects were assured of the confidentiality of their responses.

Data analysis

Pearson Product Moment Correlation (PPMC) and t-test were used in data and analyses. All hypotheses were tested at .05 alpha level of significance.

RESULTS

Hypothesis One

There is no significant relationship between teachers' competence and students' academic performance in chemistry.

The results of analysis are as shown in Table 1.

Table 1: Pearson product moment correlation analysis of teachers' competence and students' performance in Chemistry

Variable	N	$\sum x \sum y$	$\sum x^2 \sum y^2$	$\sum xy$	r	df	t-cal	t-crit	Decision At p=.05
Teachers' Competence (x)	200	13986	1009492	1039816	0.96	198	48.25	1.96	*
Students' Performance(y)	200	14424	1073960						

P<.05

The analysis in Table 1 shows that the calculated t-value of 48.25 is greater than the critical t-value of 1.96 at p<.05 alpha level. Therefore, the null hypothesis one is rejected.

This implies that there is a significant relationship between teachers competence and students' academic performance in chemistry.

Hypothesis two

There is no significant difference between the academic performance of chemistry students taught by qualified teachers and those taught by unqualified teachers.

The analysis is shown in table 2.

Table 2: t-test analysis of the performance of chemistry students' taught by qualified and unqualified teachers

Group	N	$\bar{X}$	S.D	df	t-cal	t-crit	Decision at P<.05
Qualified Teachers	85	76.43	7.66	198	16.07	1.96	*
Unqualified Teachers	115	59.24	7.12				

* = significant at p<.05

The analysis in Table 2 shows that the calculated t-value of 16.07 is greater than the critical t-value of 1.96 at p<.05 alpha level. Therefore the null hypothesis is rejected. This implies that there is a significant difference between the academic performance of chemistry students taught by qualified teachers and those taught by unqualified teachers.

Hypothesis three

There is no significant difference between the academic performance of chemistry students taught by experienced teachers and those taught by inexperienced teachers. The analysis is as shown in Table 3.

Table 3: t-test analysis of the performance of chemistry students taught by experienced and inexperienced teachers.

Variable	N	$\bar{X}$	SD	df	t-cal	t-crit	Decision at P<.05
Experienced Teachers	128	72.84	7.44	198	8.80	1.96	-
Inexperienced Teachers	72	63.25	7.21				

* = significant at p<.05

The analysis in table 3 shows that the calculated t-value of 8.80 is greater than the critical t-value of 1.96 at p<.05 alpha level. Therefore, the null hypothesis three is rejected. This implies that there is a significant difference between the academic performance of chemistry student taught by experienced teachers and those taught by inexperienced teachers.

DISCUSSION

The findings in hypothesis one showed that there is a significant relationship between teachers' competence and students' academic performance in chemistry. This might be due to the fact that the intellectual competence of the teacher is a primary asset in the quality of learning the students acquire in schools. A chemistry teacher competent in his work, possessing the qualities which enable him to inspire and develop the latent capacities of his students would automatically contribute immensely to the high academic performance of the students in chemistry. Also teachers' competence in terms of resourcefulness, effective teaching skills and good evaluation enhance students' performance. This is in line with the finding of Ivowi (1986) that there is significant relationship between teachers' competence and students; performance. This is also in agreement with the findings of Inyang (1997), that teaching is effective when the teacher makes use of instructional materials.

The results of hypothesis two showed that there is a significant difference between the performance of chemistry students taught by qualified teachers and those taught by unqualified teachers. This might be due to the

fact that a qualified teacher can translate knowledge, skills, attitudes and values in accordance with certain professional principles. A qualified teacher has a good classroom control, effective communication skills, adequate knowledge of the subject and can utilize varieties of teaching strategies in order to enhance students performance. This is in line with the work of James (1991) that all teachers need breadth and depth in the subject they will teach, including the understanding of the new knowledge and this calls for high professional qualification.

The results of hypothesis three showed that there is significant difference between the academic performance of chemistry students taught by experienced teachers and inexperienced teachers. Chemistry students taught by experienced performed better than those taught by inexperienced teachers. This might be due to the fact that the quality of education and instruction depends on the arrangement of the resources at the disposal of the teacher. This requires a lot of experience by the teacher. The performance of the students and indeed the learners is guaranteed when an effective and efficient instructional process takes place. This is in agreement with the findings of Awodi (1984) who observed that students taught by experienced teachers performed better than those taught by inexperienced teachers.

CONCLUSION

On the basis of the findings, the following conclusions were drawn.

1. There exist a significant relationship between teachers' competence and students' academic performance in Chemistry.
2. Chemistry students taught by qualified teachers performed significantly better than those taught by unqualified teachers.
3. The academic performance of chemistry students taught by experienced teachers is significantly better than those taught by inexperienced teachers.

RECOMMENDATIONS

Based on the results of the study the following recommendations were made:

1. Teaching qualification must be seen as a pre-condition for entry into the teaching profession.
2. The Federal Government's efforts in the professionalization of teaching through the establishment of the Teachers' Registration Council (TRC) is in the right direction and should be enforced.
3. For the professional growth of teachers, conferences, seminars, workshops, pre and in-service training programmes should be given adequate attention by the Ministry of Education, State and Federal Government.

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