EVALUATION OF TEACHERS PERFORMANCE IN THE TEACHING OF DIFFICULT CONCEPTS IN CHEMISTRY AFTER IN-SERVICE TRAINING

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Abstract
This study evaluates chemistry teachers' performance in the teaching of difficult concepts after in-service training. Sample consisted of forty (40) chemistry teachers randomly selected from thirty-eight public senior secondary schools in Education Districts II and IV of Lagos State. Four instruments were used to collect data for this research study, which are: "Identified Perceived Chemistry Difficult Concept" (IPCDC), "Student Evaluation of Teachers Questionnaire" (SETQ), "Teachers' Self Evaluation Questionnaire" (TSEQ), "Students' Cumulative Scores on Past Promotional Examination" (SCSPE). Data were analyzed using frequency count, Analysis of Variance (ANOVA), Chi Square and Correlation all tested at 0.05 level of significance. Results showed that chemistry teachers have positive attitude towards the teaching of difficult chemistry concepts after in-service training and also in-service training helps to improve teachers' performance and students' achievement in chemistry. The study recommends that in-service trainings should be organized quarterly to improve the productivity of chemistry teachers as to enhance performance of chemistry students and concludes that proper follow-up should be carried out after in-service trainings to ensure that what the chemistry teachers were taught are implemented.

Chemistry is one of the science subjects upon which technological break-through is built and is the pivot on which the wheel of science rotates. Chemistry is very important and helpful in fields such as medicine, agriculture, transportation,

housing, industries, etc. Life is made more meaningful with chemical product such as drugs, cosmetics, paints, soap, fertilizers etc.

It therefore becomes pertinent that performances in chemistry and in science generally should be high. However, this seems not to be the case in Nigeria because students' performances have not been encouraging (Adeyegbe, 1993). Hence, the major objective of teaching chemistry in schools is not only to communicate the spirit of science but also to ensure that students acquire the skill s of science (Ogunleye, 1999).

The table below shows the statistics of entries, performance and grades in chemistry in Senior Secondary School Certificate Examination (SSCE), West African Eination Council (WAEC), Yaba, Lagos state.

Table 1: Number and Percentage Obtaining Grade

Ear	Total Entry	Total Sat	A1	B2	B3	B4	C5	C6	Total credit 1-6	D7	E8	Total 7-8	F9	Numbe r Abs
2005	557658	349936 *97.64	6123 *1.74	10767 *3.07	51931 *14.84	21927 *6.26	23426 *6.67	64100 *18.31	178274 *50.94	30293 *8.65	35206 *10.06	65499 *17.71	97695 *27.38	7722 *2.15
2006	389462	380104 *97.59	3537 *0.93	7062 *1.85	39920 *10.50	31910 *8.39	28395 *7.47	59846 *15.74	178274 *50.94	39815 *10.47	46608 *12.26	86423 *22.73	114475 *30.11	9358 *2.40
2007	432230	422681 *97.79	4823 *1.14	10082 *2.38	47048 *11.13	35627 *8.42	31036 *7.36	65668 *15.53	170670 *44.90	51543 *12.19	53137 *12.57	104680 *24.76	111322 *26.33	9549 *2.20
2008	428513	418432 *97.65	3568 *0.85	7794 *1.86	40830 *9.76	33651 *8.04	30723 *7.34	69383 *16.58	185949 *44.44	56207 *13.48	58490 *13.98	114697 *27.41	110417 *26.39	10090 *2.35
2009	478235	468546 *97.97	2679 *0.57	6560 *1.40	49032 *10.46	27293 *5.83	32501 *6.94	86660 *18.50	204725 *43.69	49124 *10.48	64896 *13.85	117020 *24.33	119260 *25.45	9689 *2.03
2010	477573	465643 *97.50	2090 *0.45	6712 *1.44	56668 *12.17	33758 *7.28	391912 *8.42	97639 *20.97	236059 *50.70	59608 *12.80	59608 *12.80	10994 *23.61	98165 *21.08	11930 *2.50

* denotes figures in percentage

From the above data, it was observed that there is little or no improvement in students' performance in chemistry over time.

Over the years, complaints have been made regarding the falling standard of education in our great country, Nigeria. However, several studies (Ivowi 1984, Soyinbo 1986) have shown that while enrolment for senior secondary school science courses continue to increase, students' performance in sciences remain on the average.

Despite the improvements in the training of the chemistry teacher and their teaching capabilities, students' achievement in chemistry and attitudes towards chemistry continue to be low (WAEC Chief Examiners report for Senior School Certificate Examination for the year 2005–2010 indicate this). Researchers identified that these students poor performance is as a result of inadequate utilization of appropriate teaching strategies and instructional materials, teachers experience and qualification, poor attitude and the in ability to improve and among others led to the evaluation of chemistry teacher's performance in the teaching of some perceived difficult chemistry concept after in-service training.

The Concept of In-Service Training

There are many definitions of the concepts of training and manpower development as there are many authors who have attempted to define the concepts. For the purpose of this work therefore, attempt is made to examine some of these definitions:

Armstrong (1981) defines training as the systematic development of the knowledge, skills and attitudes required by an individual to perform squarely a given task or job. Training involves learning of various kinds and various situations. The in-service training program for the teachers of the post graduate level tends to increases the qualities possessed by a good teacher which positively affect the performance of a teacher. Harris and Sass (2001) studied effects of the teacher training on the teacher value added. The result further revealed that more experienced teachers appeared more effective in teaching elementary and middle school reading. Samupwa (2008) examined the effects of teacher training on the administrative work and teacher's behaviour in the classroom. Result showed significant changes in behaviour of the teachers in classroom and on the administrative work.

However, new policy directions tend to re-conceptualized in-service training as an ongoing professional development of teaching practitioners (Mothata 2000:85). This definition links up with the training that is done outside the classroom in a form of seminar and workshops.

Purpose of In-Service Training

In current situation of Nigeria Education, training is necessary to re-orientate teachers to new goals and values, to prepare them to cope with curriculum change, to train them in new teaching and learning methods and to provide them with the knowledge and skills to teach new topics. The challenge is to provide effective practice related in-service training that meet the requirement of a new curriculum and result in improved teaching and learning in the classroom.

Importance of In-Service Training

In-service training helps teacher to expand their current knowledge of subject/phase/matter, develop new knowledge and engage with colleagues at their current school and other schools. Furthermore, it helps them to plan and develop their own work thoroughly. They may also become more conscious of strategies for change and current development trends as many teachers enter the profession without having received specific training for curriculum development (Carl 1995; 265). In addition, teachers may acquire basic skills in research and decision making at various levels.

Bajomo (1994) identified the following as the effects of training and manpower development on employee's job performance. Training and manpower development give employees adequate opportunity to learn the duties and

responsibilities of their jobs so that they will be able to perform their jobs as it is expected of them.

Adeleke (2000) views training as a process of skills, knowledge and attitude acquisition for improved performance on the job, and increase in the level of individual and organizational competence. It helps to reconcile the 'gap between desired targets and actual level of performance.

Purpose of the Study

The purpose of the study is to:

Ascertain the effect of In-service training through teachers' job performances on students' achievement.

Examine the extent to which In-service training programmes can be used to enhance teachers' performance in the teaching of difficult chemistry concept.

Assess the outcome of In-service training programmes on teaching strategies.

Statement of Problem

Observations and reports from examining bodies revealed that a high percentage of secondary school students continue to perform poorly in chemistry examinations (WAEC 2005-2010). Albert bandura (1977) identified inadequate of in-service training for professional development of teachers, teachers qualification, experience, and incompetence, inadequate utilization of appropriate teaching strategies and poor attitudes towards the teaching of chemistry are some of the factors which led to poor performance in chemistry.

Research Question

The following research questions are raised to guide this study:

Is there any relationship among In-service training, teachers job performance and students achievement after in-service training?

To what extent could in-service training programme influence teaching performance of chemistry teachers?

Will in-service training programme change teachers' attitude towards teaching some perceived difficult chemistry concept?

Significance of the Study

This study is of vital importance to the students; in that, it will help them to understand some difficult concept in chemistry and improve their performance in chemistry external examinations.

On the part of the teachers, difficult concepts in chemistry curriculum could be easily clarified, it would help to update their knowledge in modern chemistry. It would

also help the society at large in that it provides job opportunity. When the students are well trained they will be able to produce things out of the chemistry they have learnt.

Methodology

Design

The study was a survey type of descriptive research. This enabled the researchers to collect data on the evaluation of chemistry teachers' performance in the teaching of some perceived difficult concepts in chemistry after in-service training.

Population of the Study

The population of the study was drawn from all the chemistry teachers and students of Public Senior Secondary Schools in Lagos State Public schools.

Sample and Sampling Technique

40 senior secondary school chemistry teachers were randomly selected from different public Senior Secondary Schools in Educational Districts II and IV of Lagos state. Twenty (20) chemistry teachers were randomly selected from each of the Education Districts. Eighteen Senior Secondary schools in Education District II and Twenty (20) Senior Secondary Schools from education District IV. On the whole, the sample is comprised of 40 chemistry teachers (20males and 20females) and Thirty-eight Public Senior Secondary Schools II and IV of Lagos State with an average age of between 28 and 50.

Instrument

Four instruments were used in this study which include: Identified Perceived Chemistry Difficult Concept" (IPCDC), "Student Evaluation of Teachers Questionnaire" (SETQ), "Teachers' Self Evaluation Questionnaire" (TSEQ), "Students' Cumulative Scores on Past Promotional Examination" (SCSPE).

Validation of Instrument

The instruments were face validated by the researchers to ensure that it is accurate in guiding the needed information before its administration. The reliability indices of the first three instruments were determined to be 0.63, 0.59, and 0.07 respectively.

Data Administration and Collection

The researchers administered the questionnaires and conducted achievement test on the respondents.

Data Analysis

The data collected were analyzed using One way Analysis of variance (ANOVA), Correlation matrix and Chi Square testing using of Statistical Package for Social Sciences (SPSS).

Research Questions

A. Is there any relationship among in-service training, teachers job performance and students achievement.

Table 4.4: Shows the correlation among teachers in-service training, teachers job performance and students achievement**.** The value of the correlation coefficient between the relationship of chemistry teachers' in-service training compared with their job performance-0.042, this implies that p is not significant at 5% level. On the other side, Table 4.5 shows that correlation coefficient between the relationships of chemistry teachers' in-service training compared with their students' performance0.104. Also, p is significant at 5% level. This shows that there is statistical interaction between students' performance, the chemistry teacher's job performance and the in-service training conducted for the teachers.

		Students performance	Job performance	In service training
STUDENTS PERFORMANCE	Pearson Correlation	1	-0.118	0.104
	Sig. (2-tailed)		0.468	0.524
	N	40	40	40
JOB PERFORMANCE	Pearson Correlation	-0.118	1	-0.042
	Sig. (2-tailed)	0.468		0.795
	N	40	40	40
IN-SERVICE TRAINING	Pearson Correlation	0.104	-0.042	1
	Sig. (2-tailed)	0.524	0.795	
	N	40	40	40

B. To what extent could in-service training programme influence teaching performance of chemistry teachers?

The results are hereby presented in Table 4.5

Table 4.5: Analysis of Variance (ANOVA) to determine the extent to which in-service training can be used to influence teaching performance

		SS
In-Service Training	Between Groups	0.293
	Within Groups	3.107
	Total	3.4
Does not enhance Teachers productivity	Between Groups	0.692
	Within Groups	8.683
	Total	9.375

		Pedagogies	In-service training
Strategies	Pearson Correlation	1	0.194
	Sig. (2-tailed)		0.229
	N	200	40
In-Service Training	Pearson Correlation	0.194	1
	Sig. (2-tailed)	0.229	
	N	40	40

Sum of Squares, df: degree of freedom

There was a significant difference between groups as determined by one-way ANOVA (F (67, 133) = 6.738, $p < .001$). This result is highly significant. We can also see from Table 4.7 above that the significance level is 0.293 ($p < .001$), which is above 0.05, as a result of this, it is proven that there is a statistically significant relationship between remuneration of teachers and in-service training.

C. Will in-service Training Programme Change Teachers Attitude Towards Teaching Some Perceived Difficult Chemistry Concepts?

A Chi-square test analysis was carried out to find out whether in-service programme will change teachers attitude towards teaching chemistry in some selected local education districts in Lagos state. The results are presented as follows:

Table 4.6: Chi-square Testing To Appraise the Extent of In-Service Programme on Teachers Attitude towards Teaching Some Perceived Difficult Concept in Chemistry

	Value	Df	Asymp. Sig. (2-sided)
Pearson Chi-Square	10.420[a]	21	0.973
Likelihood Ratio	10.117	21	0.977
Linear-by-Linear Association	1.233	1	0.267
N of Valid Cases	40		

df: degree of freedom=0.05

According to table 4.6 above, it is clear that χ (1) = 10.420, $p < .001$.There is a significant difference (our significance level is less than .05). Therefore, we can say that the two variables are associated. This means that in-service training has a strong effect on the teachers' attitude in the teaching of some perceived difficult chemistry concept in the areas covered by this research. We can see from (Appendix B) that the strength of association between the variables is relatively strong.

Conclusion

In conclusion, in-service training aided teaching pedagogy and also proper follow should be carried out after in-service trainings to ensure that the chemistry teachers were taught are implemented. There is a significant relationship between the

in-service training conducted for chemistry teachers and their job performance or productivity. In-service training programme enhances students' performance.

Recommendations/Suggestions

The following suggestions are pulled from the results. In-service trainings should be organised quarterly to improve the productivity of chemistry teachers and the performance of chemistry students.

Chemistry teachers' productivity should always be used as a determinant of improvement in remuneration as in-service trainings improves their productivity.

Proper follow-up should be carried out after in-service trainings have been conducted on teachers to ensure that the chemistry teachers implement what they have learnt after in-service training.

The gender that responds more to in-service trainings should be encouraged and the cause for unresponsiveness of the other gender should be investigated and properly resolved.

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