

# PERCEPTION OF ADULT CHEMISTRY TEACHERS' ON RE-TRAINING THROUGH OPEN AND DISTANCE LEARNING IN NIGERIA

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## ABSTRACT

The study examined the level of perception of adult chemistry teachers on re-training through Open and Distance Learning (ODL) programme in Nigeria. The study adopted a descriptive survey research design. The population of the study covered all Adult chemistry teachers in National Open University of Nigeria (NOUN). Five research questions and hypothesis were formulated to guide the study. The sample covered 300 adult chemistry teachers selected through purposive random sampling. The research instrument for the study was a questionnaire designed by the researchers. The reliability coefficient of the instrument was determined using Cronbach alpha and this yielded index of  $r=0.73$ . Data was analysed using percentage, mean and standard deviation while all hypothesis were tested at 0.05 significant levels. The findings revealed a significant difference in the perception (Positive and Negative) of adults chemistry teachers in their retraining programme through ODL. Also the study showed that there is a positive significant relationship between the perception of adult chemistry teachers and their interest in the program. The study also revealed that positive perception of effectiveness of the programme to a large extent influence the interest of adult chemistry teachers in the programme. Furthermore, the study revealed that there is a significant influence of adult chemistry teacher involvement in the retraining through ODL for their professional development. Finally, the study showed a significant gender difference in the perception of adult chemistry teachers on the programme. Based on the findings it was recommended among other thing, that Institutional base Chemistry teachers' development (IBCTD) approach for continuing professional development of Adult chemistry teachers at the secondary education should be adopted to give teachers access to retraining.. To achieve this, ODL institutions should create a department to handle and organise such training and retraining programme according to their capacity and competency for more efficiency

**Keywords:** Adult Chemistry Teachers, Re-training, Teacher Education in Nigeria, NOUN, Open and Distance Learning.

## INTRODUCTION

The role of teachers in secondary education process is central to teacher education programme (Okafor, 2010). Teacher training programme in Nigeria has undergone radical changes over the years. It started with the training of Grade IV; Grade III; Grade II; the Nigeria Certificate in Education (NCE) and now Institutes and Faculties of Education in the Universities. The essence

of these changes is to improve the quality and competence of the teachers (Okeke, 2001 & Wellington 2001). Okafor (2005) reaffirmed that teachers are the main determinants of quality in education. She pointed that if they are uncommitted, unmotivated, uninspired and untrained the whole nation is doomed. This entails that the kind of secondary school teachers trained in Nigerian Colleges of Education need re-training or upgrading to enhance quality and performance (FME, 2004). The emphasis here is basically on adult chemistry secondary school teachers who had NCE Certificate but the National Policy Document (FME, 2004) demands University Certification for quality assurance. The quality of chemistry teaching in the secondary schools cannot be compromised while considering the role of chemistry in human existence (Okorie, 2010). No wonder the year 2011 was celebrated as International Year of Chemistry (IYC). The goals of the IYC were to increase public appreciation of chemistry in meeting world needs, to encourage interest in chemistry among young people and to generate enthusiasm for the creative future of chemistry (Chemistry World, 2011). Research summary has shown that chemistry teaching is unpopular, uninspiring and irrelevant to the students and does not promote higher order cognitive skills acquisition leading to gaps between the wishes of students and teachers (Holbrook, 2005 & Ndanusa, 2007). Secondary school adult chemistry teachers who have been teaching for over twenty years with NCE Certificate are afraid of change because of increasing scope of chemistry and its process and thus need re-training otherwise, chemistry education in Nigeria would continue to experience pitfalls in attainment of its goals.

## **TEACHER EDUCATION MINIMUM STANDARD IN NIGERIA**

There has been a growing concern among the science education stakeholders in Nigeria on the quality of science teachers in senior secondary schools where teacher education is viewed as the key to the transformation of the sector (Obebe, 2002 & Ivowi et al. 2005). However, the crucial role of chemistry teachers in an educational programme is well accepted. The preparation of chemistry teachers for the implementation of educational programme has received the attention of governments and individuals. In the university faculty of education and Colleges of Education in Nigeria, there are various programmes for training and re-training of teachers for secondary school system. Presently, 56 Faculties of Education, one University of Education and five Colleges of Education are accredited to award degrees in Education (Okebukola, 2012). He also stated that about 30, 000 teachers are produced annually from the system and are assigned to teach in both junior and senior secondary schools. However, Nigeria under the auspices of the National Universities Commission (NUC) has minimum standards that provide the following objectives for training graduate teachers which include to:

- Produce prospective teachers who have sound mastery of their subject areas and the ability to impart such knowledge to their students;
- Equip prospective teachers with a mastery of problem solving skills;
- Produce highly motivated conscientious and efficient classroom teachers;
- Produce prospective teachers with proper leadership qualities;

- Produce prospective teachers with the knowledge, skills and attitudes which will enable them contribute to the growth and development of their communities in particular and their nation in general;
- Encourage the spirit of equity and creativity in teachers; and
- Enhance commitment to the teaching profession.

In this document, the minimum knowledge, skills and attitude expected to be developed by the teacher trainees upon graduation are specified for the institution offering the training to strictly emphasise and achieve (Okebukola, 2012). The result of teacher education activities reviewed by Okafor (2007) revealed that inadequacies in teacher competence and untrained teachers exist in the classroom. In the same vein, a number of restructuring of teacher education programme are done but teachers perception on some of the programmes that involve their re-training are yet to be addressed. Consequently, open and distance learning is introduced in Nigeria by establishment of the National Open University of Nigeria (NOUN) as to address the teachers' views about re-training.

### **TEACHER EDUCATION BY OPEN AND DISTANCE LEARNING (ODL) THROUGH NATIONAL OPEN UNIVERSITY OF NIGERIA (NOUN)**

Open and Distance Learning (ODL) has a history of over a century involving different teaching pedagogies and following the trend of technology in the delivery of educational materials as well as communication between learner and instructors (Leary & Berge, 2007). They further affirmed that research in ODL seldom deals with pedagogical interactions, acquisition of social and life attitudes as well as real life values (Govindasamy, 2002). ODL is also targeted at particular groups with special characteristics and imminent learning needs (adult and life-long learning). The National Open University of Nigeria (NOUN) on the other hand, is Nigeria's leading and only specialist provider of ODL at tertiary level. NOUN provides instruction and research in order to produce high calibre teachers and thus contribute to national manpower development. It also provides opportunity for the professional development of serving graduate teachers through improving and sustaining the efforts of the federal government of Nigeria. It is the first of its kind in the West African Sub-Region. At present it has 50 study centres spread across the nation. The centres are distributed according to zones. South-East has six(6) centres, South- West, 12 centres; South-South, none ; North-East has eight (8) centres, North-West seven(7) centres and North-Central 17 centres totalling 50 centres. According to the vice-chancellor of the university, Professor Vincent Tenebe, the university has a student population of over 120,000. Its pioneer student's enrolment stands at 32,400. It currently offers over 50 programmes and 750 courses, stair casing through from certificate to diploma and degree levels and maintain a strong commitment to internationalisation. The university currently rated 7<sup>th</sup> position among universities in Nigeria and 86<sup>th</sup> position out of the 100<sup>th</sup> universities in Africa by Webometric International. In addition, NOUN was given the European quality Award in education 2011 at Oxford, United Kingdom, among others. NOUN provides alternative or supplement to adult graduates who could not make it as full time in other tertiary institutions. Though the institutions had been there over the years, the varying views of teachers perception on retraining through NOUN is yet to be ascertained. Under close consideration, Wellington (2001) explained that the re-training of graduate teachers through open and distance learning is not content bound but

subject to teachers' bound on retraining. Though much research has been conducted on the perception of adult learners to the teaching approaches, there is a dearth of research in the direction of how adult graduate chemistry teachers perceive retraining through open and distance learning in the National Open University of Nigerian. The specific context of this paper therefore was to ascertain the perception of adult chemistry teachers in senior secondary schools on professional development through Open and Distance Learning programme at the NOUN.

### **Statement of the Problem**

Across the Sub-Sahara African region, half of the secondary school teachers are half baked graduates with minimal qualifications (Okebukola 2012). Akpan (2011) observed that professional development institutions are rare and qualification upgrading programmes in existence do not use pedagogy that will benefit the trainees. Various attempts have been made in the past to produce enough chemistry teachers and upgrade their teaching pedagogies in senior secondary schools through conventional universities, yet there had not been any improvement in professional development in science due to the difficulties the teachers experience in combining work and schooling. (Ivowi, et al. 2005). This therefore, has led to an interest in the open and distance learning as an alternative programme for chemistry teachers, teaching for over 20 years and are also beyond 45 years of age as an opportunity to work and be re-trained in NOUN. Records have shown a disturbing trend of inadequate accessibility, varying perceptions and other challenges that inhibit teachers re-training through ODL (Ahiatrogah, 2010). Thus the question that is germane to this study is what is the perceptions of adult chemistry teachers on retraining of teachers through Open Distance Education in Nigeria.

The main purpose of the study is to examine the perception of adult chemistry teachers' on retraining through Open Distance Learning Education. In specific terms the study will:

- i. Determine the extent to which the perception of adult chemistry teachers influence the interest of teachers in retraining through ODLP
- ii. Determine the extent to which the effectiveness of retraining through ODLP influences adult chemistry teachers towards retraining through same method
- iii. Determine if training through ODLP enhance professional development
- iv. Determine if gender plays any significant role in the perception of Adult Chemistry students on the use of ODLP in retraining of teachers

### **Research Hypotheses**

1. There is no significant difference in the perception of adult chemistry teachers on the use of ODLP in the retraining of chemistry teachers in Nigeria
2. There is no significant influence of adult chemistry teachers' perception on retraining through ODLP and their interest in retraining through ODLP.
3. There is no significant relationship between the chemistry teachers perception of effectiveness and retraining through ODLP

4. There is no significant effect of retraining adult chemistry teachers through ODL on professional development of adult chemistry teachers
5. There is no significant difference in the perception of male and female adult chemistry teachers on retraining through ODLP

## METHODOLOGY

**Research Design:** The study adopted a descriptive survey research design. This method was deemed the most appropriate design for this study because it involves selecting chosen samples from a large population to discover the relative incidence distribution and interrelations of some important variables.

**Population:** The population for the study was all the adult chemistry teachers on re-training at the National Open University of Nigeria (NOUN). NOUN has 50 centres across the six geopolitical zones of Nigeria through ODL programme.

### **Sample Size and Sampling Technique**

The sample size for the study covered 300 adult chemistry students in National Open University of Nigeria. In selecting the respondent, a multi-stage sampling approach was sampled. First, there are six geopolitical zones in Nigeria with NOUN centres across the six geopolitical zones of Nigeria.

Using a simple random sampling technique, 2 zones (South East & South West) were selected. Thereafter 3 centres each were selected from the two participating Zone. On the whole 6 centres were selected. Using Purposive random sampling, 50 adult chemistry re-trainees in each of the 6 centres were selected. In all, a total of 300 adult chemistry students formed the sample size. Only Master in Education Chemistry student and 200-300 level bachelors chemistry education adult re-trainees are considered in this study because they are neither new intakes nor graduating class.

### **Instrumentation**

Adult Chemistry Teacher's Perception on Open and Distance Education Questionnaire (ACTPODEQ) designed by the researchers was used for data collection. The questionnaire was a 30-item question consisting two sections. Section A has four (4) items that asked questions on age, gender, work experience and academic experience. Section B is made up of 26 items that focused on the perception, effectiveness, interest in ODLP and professional development. The items were structured on a four point Likert scale comprising of the following options: Strongly Agree (SA); Agree (A); Strongly Disagree (SD) and Disagree (D).

**Validity of Instrument:** The instrument was trial tested on a sample of 53, randomly selected from adult's students from a centre in Lagos (Victory Study Centre) in South –West zone of Nigeria that did not form part of the sample. The trial-testing enabled the researchers to have a trial run of the items selected as well as developing content and construct validity of the items. For the trial test, five items were reviewed for clarity before the main study. The reliability coefficient was determined using Cronbach alpha and this yielded reliability index of  $r=0.73$ .

**Data Analysis:** Data collected were analysed using both descriptive and inferential statistics. All hypothesis tested were held at 0.5 alpha significance level

## Results

In the null form, the hypothesis 1 states that there is no significant difference in perception of adult chemistry teachers on the use of ODL in the retraining of chemistry teachers in Nigeria. In order to test for the relationship between the two variables T-Test statistical tool was used and the result is presented in table 1 below

**Table 1: t-test analysis showing difference in perception of adult chemistry on the use of ODL in retraining programme**

| Variables           | N   | Mean  | SD  | df  | Cal t-value | Crit t-vale |
|---------------------|-----|-------|-----|-----|-------------|-------------|
| Positive Perception | 99  | 13.3  | 1.4 | 296 | 2.76        | 1.96        |
| Negative Perception | 199 | 12.70 | 3.2 |     |             |             |

$P < 0.05$ ;  $df = 298$

## Interpretation

The results from the table 1 indicates the mean score 13.3 for positive perception of adult chemistry teachers on the use ODL in the retraining of teachers than negative perception with a mean value of 12.70. Based on the table presented above, the t- calculated 2.76 is significantly greater than the t-critical of 1.96 given 296 degree of freedom at 0.05 level of significance. Thus the null hypothesis which stated that there is no significant difference in the perception of adult chemistry teachers on the use of ODL in the retraining program of chemistry teachers in Nigeria hypothesis was accepted.

In the null form, the hypothesis 2 states that there is no significant influence of adult chemistry teachers' perception on retraining through ODLP and their interest in retraining through ODLP. In order to test for the relationship between the two variables Pearson Product Moment correlation statistical tool was used and the result is presented in table 2 below

**Table 2 showing Pearson Moment Correlation Coefficient showing relationship between teachers' perception and interest in retraining in ODL program**

| Variables           | N   | Mean | SD  | df  | r-cal | r-crit |
|---------------------|-----|------|-----|-----|-------|--------|
| Teachers Perception | 298 | 6.1  | 1.7 | 296 | 0.63  | 0.61   |
| Interest in ODLP    | 298 | 5.7  | 1.5 |     |       |        |

$P < 0.05$ ;  $df = 598$ ;  $r\text{-crit} = 0.61$

Based on the table presented above, the r- calculated (r-cal = 0.63) is significantly greater than the r-critical (r-crit=0.61) given 296 degree of freedom at 0.05 level of significance. Thus, the null hypothesis which stated that there is no significant relationship between Teachers perception and interest in retraining in ODL program was rejected while the alternate hypothesis was accepted.

In the null form, the hypothesis 3 states that there is no significant relationship between chemistry teachers' perception of effectiveness and retraining through ODLP. In order to test for the relationship between the two variables Pearson Product Moment correlation statistical tool was used and the result is presented in table 3 below

**Table 3 showing Pearson Moment Correlation Coefficient showing relationship between effectiveness of ODLP and Teachers Perception**

| <b>Variables</b>             | <b>N</b>   | <b>Mean</b> | <b>SD</b>   | <b>df</b>  | <b>r-cal</b> | <b>r-crit</b> |
|------------------------------|------------|-------------|-------------|------------|--------------|---------------|
| <b>Effectiveness of ODLP</b> | <b>298</b> | <b>6.1</b>  | <b>11.7</b> |            |              |               |
|                              |            |             |             | <b>296</b> | <b>0.7</b>   | <b>0.61</b>   |
| <b>Teachers Perception</b>   | <b>298</b> | <b>5.7</b>  | <b>7.2</b>  |            |              |               |

P< 0.05; df =296; r-crit =0.61

Based on the table presented above, the r- calculated (r-cal = 0.7) is significantly greater than the r-critical (r-crit=0.61) given 296 degree of freedom at 0.05 level of significance. Thus, the null hypothesis which stated that there is no significant relationship between effectiveness of ODLP and Teachers perception was rejected while the alternate hypothesis was accepted.

In the null form, the hypothesis 4 states that there is no significant effect of retraining adult chemistry teachers through ODL on professional Development of adult chemistry teachers. In order to test for the relationship between the two variables Pearson Product Moment correlation statistical tool was used and the result is presented in table 4 below

**Table 4 showing Pearson Moment Correlation Coefficient showing relationship Retraining through ODLP and professional development of Chemistry teachers**

| <b>Variables</b>                | <b>N</b>   | <b>Mean</b> | <b>SD</b>  | <b>df</b>  | <b>r-cal</b> | <b>r-crit</b> |
|---------------------------------|------------|-------------|------------|------------|--------------|---------------|
| <b>Retraining</b>               | <b>298</b> | <b>5.1</b>  | <b>3.7</b> |            |              |               |
|                                 |            |             |            | <b>296</b> | <b>0.63</b>  | <b>0.61</b>   |
| <b>Professional Development</b> | <b>298</b> | <b>4.67</b> | <b>3.2</b> |            |              |               |

P< 0.05; df =296; r-crit =0.61

Based on the table presented above, the r- calculated (r-cal = 0.63) is significantly greater than the r-critical (r-crit=0.61) given 296 degree of freedom at 0.05 level of significance. Thus, the

null hypothesis which stated that there is no significant relationship between retraining and professional development of adult chemistry teachers was rejected while the alternate hypothesis was accepted.

In the null form, the hypothesis 5 states that there is no significant gender difference in perception of adult chemistry teachers on the use of ODL in the retraining of chemistry teachers in Nigeria. In order to test for the relationship between the two variables t-test statistical tool was used and the result is presented in table 2 below

**Table 5: t-test analysis showing gender difference in perception of adult chemistry students on the use of ODL in retraining programme**

| Variables | N   | Mean  | SD  | df  | Cal t-value | Crit t-vale |
|-----------|-----|-------|-----|-----|-------------|-------------|
| Male      | 116 | 17.3  | 7.4 | 296 | 2.62        | 1.96        |
| Female    | 182 | 19.70 | 5.2 |     |             |             |

P < 0.05; df = 296

### Interpretation

The results from the table 5 indicates the mean score 19.70 for female adult chemistry teachers on the use ODL in the retraining of teachers than male adult chemistry teachers with a mean value of 17.3. Based on the table presented above, the t- calculated 2.62 are significantly greater than the t-critical of 1.96 given 296 degree of freedom at 0.05 level of significance. Thus the null hypothesis which stated that there is no significant gender difference in the perception of adult chemistry teachers on the use of ODL in the retraining program of chemistry teachers in Nigeria hypothesis was accepted.

### Discussion

The findings from hypothesis 1 show that there is a significant difference in perception of adult chemistry students on retraining through ODL. In other words there is a divided opinion on the use of ODL for retraining of adult chemistry candidates. This division in views could be traced to the work McGettigan (1999) who noted three main areas of dissatisfaction of students with their distance learning experiences: angry, unsympathetic instructors; the feeling of being treated as second-class students; a lack of adequate education and/or training for DETS instructors and number of years it takes to graduate students in the programme.

Similarly, the findings also revealed that there is a significant effect of adult chemistry students' perception and their interest in using ODL in their retraining programmes. In other word perception of the students whether positive or negative to a large extent influences their decision to enrol in ODL programme. While there are so many benefits accrued to retraining through ODL programme, negative perception of the students about the use of ODL retraining may have hindered retraining of teachers through this mode. This result is supported by findings of Kegan in Babarinde (2006) who blamed the lack of interest of most prospective ODL

programme on the non provision of the essential facilities such as facilitators, internet services, study centres, adequacy of the relevant course materials as well as tutorial sessions.

Also, the study also shows that there is a significant relationship between the effectiveness of the programme and the perception of adult chemistry students on the use of ODL in the retraining of teachers. The level of effectiveness of ODL programmes in Nigeria to a large extent influence the choice of programme in conventional University as against the ODL. This finding is supported by the findings of Abdurkarrem (2009) who blamed the negative perception of students and facilitators on ODL on poor management of ODL in Nigeria.

In addition, the result also revealed that there is a significant relationship between involvement in retraining through ODLP and professional development of teachers. Despite the challenges of ODL in Nigeria, the study however revealed that there is a significant relationship between adult chemistry teachers retraining through ODL and their professional development. Therefore, retraining or continuous professional development should aim at providing further knowledge, skills and attitudes to the teacher to improve his/her performance on the job with a view to promoting quality in education which is not the case with the Nigeria teachers as evidence from this study.

Finally, the result shows a gender difference in the perception of male and female adult chemistry students on the use of ODL in for retraining purposes. While male student appears to have a more positive disposition about the use of ODL in the retraining programme, the same may not be said about the perception of female adult chemistry students. This difference in perception may be as the general disposition of male in ICT related activities on which ODL is based (Johnson, 2012)

## **Conclusion**

The National Policy of Education states that retraining of teachers through Open Distance Education in Nigeria is a good vision in the provision of equal and life-long education and competency of teachers in our schools. However, the perceptions of adult chemistry teachers on the programme still differ because of many challenges and ills of the programme, for this vision to be realised there is need for adequate attention to the issue of effective administration of the programme so that the purpose of this policy could be actualised.

## **Recommendations**

In order to develop a viable retraining program for adult chemistry teachers of secondary schools in Nigeria through ODL, policy makers/government need to:

- Clearly define the objectives of the programme and have a written documents stating how and the type of retraining program that should be administered to in-service teachers by ODL institutions. This will improve accessibility, equity in training of teachers as well as the effectiveness of the program.
- It is also recommended that Institutional base Chemistry teachers' development (IBCTD) approach for continuing professional development of Adult Chemistry teachers at the secondary education level should be adopted to give all chemistry school teachers access to such retraining. To achieve this, ODL institutions should create a department

to handle and organise such training according to their capacity and competency for more efficiency.

- Also ODL institutions in Nigeria should identify requisite resources for materials development, production and distribution of teachers support provision and facilities for more effective administration of ODL programs in Nigeria
- Finally, there is need to assist the female chemistry teachers in the ODL programme the area of use of ICT facilities to enhance the quest in the program. Such assistance can come in the area of ICT training in their respective schools to enhance their capacity in utilization of ICT in ODL programs

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