AN EVALUATION OF CLASSROOM EXPERIENCES OF BASIC SCIENCE TEACHERS IN SECONDARY SCHOOLS IN EBONYI STATE OF NIGERIA.

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ABSTRACT: *The aim of this study was to evaluate the Classroom Experiences of Basic Science Teachers in Context of Competencies and Opinions. Two instruments were developed and used for the study, the instructional skills performance level (ISPL) based on five-point performance scale and questionnaire. The two instruments were developed by the researcher and validated by 3 specialists in Science Education, one from measurement and evaluation and two from biology and Chemistry. The questionnaire was administered on 200 Basic Science Teachers randomly selected from Ebonyi State Junior Secondary schools. The questionnaire was divided into 2 sections. Section I contains all the variables. Section II contains a 10-point item scale constructed by the researcher seeking the opinions of basic Science Teachers. It also contains a list of 76 instructional materials used in teaching Basic Science. The Results showed that Basic Science teachers seem to have a title performance level in classroom management and students participations and in evaluation/summary. They performed averagely in the remaining 3 instructional skills; it was also found that most teachers who teach Basic Science used lecture and demonstration method in teaching. Based on the findings, recommendations were made.*

KEYWORDS: Education, Classroom Experience, Teachers, Secondary, Nigeria

INTRODUCTION

Formal Education was introduced into our country (Nigeria), by the white Missionaries in 1842 Baja in Omiko (1987). At this period, the curriculum emphasized three main things;- Reading, writing and Arithmetic. Survey studies carried out by Taiwo (1975), Abdullahi (1982) and Ukpai (1985), showed that teaching and learning of science in Nigerian schools started as far back as 1878. According to them, science was taught as general science to classes one and two in the secondary schools and as biology, chemistry and physics to upper classes of three, four and five.

However, according to the Science Teachers Association of Nigeria (STAN 1970) in Omiko (2015), this general science continued until 1970 when Integrated Science, now Basic Science, was introduced as a base to express the fundamental unity of scientific thought. The teaching and learning of integrated science replaced the general science and was taught in Nigerian schools up to 1980 when the Federal Government restructured the 5-years secondary school system into 6-3-3-4 system. That is 6 years primary Education, 3-years junior secondary school (JSS) Education, 3-years Senior Secondary School (SSS) Education and 4-years tertiary education (FRN, 1981). The teaching and learning of integrated science in Nigerian schools especially at the Junior Secondary school level continued till 2009 when the Federal Government of Nigeria restructured the 6-year secondary school system into 9-3-4 system. The reform Agenda in Education in Nigeria brought a change in integrated science

both in content and name. The content was broadened and the name changed from integrated science to basic science. Oka (2015) and Nwafor (2012) observed that basic science formally known as integrated science is a subject taught at both public and private schools at the Junior Secondary school level. Basic Science is an introductory course to the study of the sciences in the senior secondary school. The definition of integrated science (Basic Science) as was given by UNESCO (1973), and Omiko (2005) is a science in which concepts and principles are presented so as to express the fundamental unit of scientific taught and avoiding premature or undue stress on the distinction between various scientific fields. Ukpabi (1985) in Omiko (2005) defined Basic Science as a science in undifferentiated form which stresses the fundamental unity of science. Basic science involves the study of elementary biology, anatomy, earth/solar system, ecology, genetics, chemistry and physics as a single science subject in the Junior Secondary school. It offers the basic training in scientific skills required for human survival, sustainable development and societal transformation. Basic science studies also involve bringing together traditionally separate science subjects so that students grasp a more authentic understanding of science.

The study of Basic science (Integrated science) is a new way of studying science, according to Omiko (2012) and Anaekwe et al (2010), Basic Science was introduced into this country Nigeria a few decades ago. It started with few schools, and now all the junior secondary schools in the country have adopted it.

According to the National Policy on Education (FRN, 2004) the aims of Basic Science (Formerly Integrated Science) should be directed at enabling students who are exposed in it, to acquire the following skills:

1. Observe carefully and thoroughly

2. Report completely and accurately what is observed.

3. Organise information acquired

4. Generalizing on the basis of the acquired information

5. Predicting as a result of the generalization

6. Designing experiments (including control where necessary) to check predictions.

7. Using models to explain phenomena where appropriate; and

8. Continuing the process of inquiry when new data do not conform to predictions.

To achieve these objectives, it is suggested that the teaching and learning of Basic science should involve the use of innovative methods of teaching like discovery, problem-solving, open-ended field trips and laboratory methods and among others. Omebe and Omiko (2015) observed that these suggested methods of teaching Basic science have been utilized for several years by the integrated science teachers and yet the results of the students in the Junior Secondary School Certificate Examination (JSSCE) has not been encouraging. Presently the current statistics on the students' academic performance in the Junior Secondary School Certificate Examination (JSSCE) in Ebonyi state tend to show that the teaching and learning of Basic science as a subject at the junior secondary school level is still inadequate. For example table 1 below shows the performance of students in Basic Science in the JSSCE in Ebonyi State from 2011 to 2013.

Table 1: Results of Students in Basic Science, in Ebonyi State from 2011 to 2013.

Year	Distinction	Credit	Pass	Failed	Absent	Total
2011	1470	11136	14418	448	250	27,722
2012	1744	10823	19165	270	116	32,118
2013	1486	8520	18902	450	260	29,618

Source: Ministry of Education, Abakaliki, Ebonyi State of Nigeria (2015)

From the above data, it can be deduced that the performance of the junior secondary school students in Basic science in Ebonyi State is not encouraging. This status may be attributed to lack of trained teachers, lack of proper teaching materials, absence of conducive teaching and learning environment, inadequate evaluation or probably, inadequate teaching methods. The researcher therefore sought to evaluate the classroom experiences of the Basic science teachers while teaching the subject.

Statement of the Problem

In the present Science Education Programme in Nigeria, most basic science teachers were not trained specifically in basic science, but in one or two subjects in various science disciplines. A number of researchers Omiko (2014), Akpan (2015) and Ivowi and Akpan (2012) found that most basic science (Integrated Science) teachers are not academically qualified to teach the subject. Normally, teachers teach what they know. The implementation of the JSSCE curriculum effectively depends on the quality of the teachers. A look at the J.S.S.C.E. Results of schools in Ebonyi State reveals that students' performance in Basic Science is not encouraging.

In view of this background, there appears to be some problems as to whether Basic Science teachers presently in our schools are competent in teaching the subject as expected. The problem of this study therefore was to evaluate the classroom experiences of the basic science teachers in Ebonyi State junior secondary school system.

Purpose of the Study

The main purpose of this study was to evaluate the classroom experiences of Basic Science teachers while teaching. Specifically the study was aimed at: (1) performance level and (2) opinions on the various aspects of Basic Science curriculum content by the basic science teachers.

Scope and of Area of the Study

The study focused on the evaluation of classroom experiences of basic science teachers in the three education zones in Ebonyi State of Nigeria.

The variables which the researcher considered are:-

    (1)   Sex
    (2)   Qualification
    (3)   Subject Area of specialization
    (4)   School location.

Research Questions

The following research questions guided the study

1. What are the abilities of Basic Science teachers on topic and curriculum?

2. Are the Basic science teachers competent in preparation and introduction of the topics?

3. What are the performance levels of the Basic science teachers on methods and Teaching Aids?

4. Do the Basic science teachers consider classroom management and students participation appropriate?

5. Do Basic science teachers make use of appropriate methods of evaluation and summary?

6. What teaching methods do the Basic Science teachers use in teaching the subject?

7. Do the Basic science teachers consider the curriculum content of Basic Science and teaching aids suitable for the junior secondary school (J.S.S)?

Hypotheses

The following hypotheses guided the study.

1. The Basic Science Teachers experiences on curriculum content significantly independent of their sex

2. The Basic Science Teachers' opinions on curriculum content are significantly independent of their subject Area of specialization. The level of testing the hypotheses is 0.05 significance.

METHODOLOGY

Design of the Study

The study is an observational as well as descriptive study. The techniques employed were due to the fact that the study aimed at finding out actual classroom experience of the Basic Science Teachers in Ebonyi state junior secondary school system.

Population and Sample of the Study

The population of the study comprised of all the Basic Science Teachers in Ebonyi State junior secondary schools. The sample of the population of the Basic science teachers used for this study was 200 Basic science teachers randomly selected from the three (3) Education zones of Ebonyi state (Abakaliki, Onueke and Afikpo Education zones). The table below illustrates the sample size

Table 2: **The Sample of the Basic Science Teachers and their Subject Area of Specialization**

Subject	Biology	Chemistry	Physics	Basic Science	Others	Total
Teachers	80	55	23	21	21	200

Instrumentation

There are two types of Instruments used in this study. The first instrument employed was instructional skill performance level (ISPL) Instrument developed by the researcher following Nworgu (1986). The ISPL is a – 31 – item – 5- point rating scale. Each item assesses the extent of performance with which a specific skill was employed during a given lesson. The items were grouped into five (5) categories namely curriculum and topic, method and materials, preparation and introduction, classroom management and students participation and evaluation and summary. The 5-point scale associated with the ISPL was interpreted as follows:

5 High level of performance

4 Slightly above average performance level.

3 Average performance level

2 Low level of performance

1 No level of performance

The second instrument employed by the researchers was questionnaire which contained two sections, section I contains all the variables studied and section II contains a 10-point item scale constructed by the researcher seeking the opinion of the Basic science teachers on the curriculum and content. Section II also contains lists of 76 instructional materials for teaching Basic science according to the Science Teachers Association of Nigeria (STAN).

Validation of the Instrument

The instructional skill performance level (ISPL) instrument was validated by four (4) specialists in Science Education and Measurement and Evaluation from the Department of Science Education, University of Nigeria, Nsukka.

Reliability of the Instrument

The co-efficient of concordance between a pair of raters each and that of the four (4) raters was calculated. The result was 0.50. It was used to assess the extent of agreement between the four (4) raters.

Data Analysis

On observation, the mean rating for each item was computed. Based on the 5-point scale used, the mean performance rating (M.P.R) were interpreted as follows:

Above 4.5 – high performance level

3.5-4.5-slightly above average performance level.

2.5-3.5-average performance level

1.5-2.5 – little performance level

Below 1.5 no performance level

On the Opinion Mean Score (OMS) of the Basic Science Teachers on the problems of teaching basic science in the present basic science curriculum for J.S.S., the mean scores were used to answer the research questions. Any mean score equal or less than 2.50 was regarded as either agreement or disagreement as the case may be. The percentages of various instructional materials for teaching Basic science available in the sample schools were also calculated to aid answer the research questions.

RESULTS

(1)   Results based on observation:

Research question 1: What are the abilities of Basic science teachers on topic and curriculum?

Table 3: Mean Performance Rating of Basic Science Teachers on Topic and Curriculum

S/N	Method of Teaching Basic Science	Mean Rating
1.	Ability to follow Basic Science curriculum in sequence	3.30
2.	Ability to select topics according the Basic science curriculum	3.33
3.	Ability to arrange the topics in sequence	3.08
4.	Ability to break the topics into subject matter	3.25
5.	Ability to put the subject matter in a hierarchy of difficulty levels	3.23
	Grand Mean	**3.23**

As indicated by the mean performance rating on the items under topic and curriculum, the basic science teachers demonstrated an average performance level on all the instructional scale associated with this area. The mean performance level ranges from 3.08 – 3.33 and grand mean of 3.24 which as well indicated that the teachers performed well in all.

Research Question 2

Are Basic Science Teachers competent in preparation and introduction?

Table 4: Mean Performance Ratings of Basic Science Teachers on Preparation and Introduction

S/N	Method of Teaching Basic Science	Mean Rating
6.	Ability to select appropriate instructional objectives	3.45
7.	Ability to select necessary learning experiences	3.27
8.	Ability to arrange lesson notes sequentially	3.63
9.	Ability to use appropriate entry behaviour	3.33
10.	Ability to stimulate students interest	3.46
	Grand Mean	**3.43**

Data on table 4 above revealed that the Basic Science Teachers demonstrated a slightly above average performance level in item 8(3.63) and an average performance level in the rest of the items 3.45, 3.27, 3.33 and 3.46. However the Grand mean of MPL is 3.43 indicating an average performance level.

Research Question 3

What are the performance levels of Basic Science teachers on methods and Teaching Aids?

Table 5: Presents Mean Performance Level of Basic Science Teachers on Methods and Teaching Aids (MTA)

S/N	Method of Teaching Basic Science	Mean Rating
11.	Ability to use appropriate teaching methods	3.30
12.	Ability to select adequate teaching Aid	3.33
13.	Ability to display teaching aids properly	3.60
14.	Ability to utilize the teaching aids effectively	2.93
15.	Ability to use appropriate questions	3.88
16.	Ability to spread questions in class	3.25
17.	Ability to link present lesson with the previous lesson	3.18
18.	Ability to react appropriately to students questions in the class	3.38
19.	Ability to use reinforcers	2.85
20.	Ability to use periodic summary	2.38
	Grand Mean	**3.11**

From the results on table 5 above, it can be inferred that the teachers of Basic science got a slightly above average performance level in the appropriate use of questions and little performance level on the ability to make use of periodic summary. While an average level of performance was observed on items- 11, 12, 13, 14, 17, 18 and 19. The grand mean of 3.11 shows that the teachers had an average performance level.

Research Question 4

Do Basic science teachers consider classroom management and students participation appropriate?

Table 6: Presents mean performance level of Basic Science Teachers on Classroom Management and Students Participation

S/N	Classroom management and students participation	Mean Rating
21.	Ability to arrange the class in order of height	3.25
22.	Ability to control unnecessary excitement	3.33
23.	Ability to control unnecessary movement in the class	3.03
24.	Ability to arrange students' keenness in the lesson	2.43
25.	Ability to device methods for students to use in evaluating their own progress	1.68
26.	Ability to organize practical work	2.19
27.	Ability to stimulate the students to ask questions during practical works	1.93
28.	Ability to take individual differences of the students into account	2.38
	Grand Mean	**2.53**

Data on table 6 above, classroom management and students participation (CMSP) shows that the Basic Science teachers demonstrated a little performance level on items 24, 25, 26, 27 and 28, and an average level of performance on items 21, 22 and 23. The Grand Mean of 2.53 indicates a little performance level.

Research Question 5

Do Basic Science Teachers make use of appropriate method of evaluation and summary?

Table 7: Presents Mean Performance Level of Basic Science teachers on Evaluation and Summary

S/N	Evaluation and Summary	Mean Rating
29	Ability to base evaluation on instructional objectives	3.28
30	Ability to develop test blue print which relates objectives to course content and specifies the emphasis to be given to each type of outcomes	1.89
31	Ability to evaluate individual assignment under direct study	1.83
32	Ability to carry out comprehensive summary of the study	3.65
	Grand Mean	**2.65**

On evaluation and summary, it can be seen from Table 7 above that the Basic Science Teachers demonstrated a little performance level on item 30 and 31 and showed an average level of performance on items 29 and 32. Consequently, the overall mean of 2.65 also shows an average level of performance.

Research Question 6

What teaching methods do the Basic Science Teachers use in Teaching?

Table 8: Presents the methods used by the Basic Science Teachers in teaching the Subject

Method Used	Physics	Chemistry	Biology	Biochemistry
Lecture Method	63	31	25	80
Demonstration method	20	40	75	10
Discovery method	29	40	10	10
Project method	0	15	10	10
Discussion method	36	20	15	42
Field trip method	0	15	10	10
Recitation method	27	24	35	18
Others	25	15	10	10

The data above reveals that he methods frequently used by these teachers are the lecture method and the Demonstration method. The physics and Bio-chemistry teachers used more of lecture method while the biology teachers used more of demonstration method.

Research Question 7

Do the basic science teachers consider the curriculum for basic science content and teaching aids suitable for the junior secondary schools?

Table 9: Presents the Opinion Mean score (OMS) of Basic Science Teachers on Suitability of Curriculum Content and Teaching Aids for Basic Science in J.S.S.

S/N	Item (Opinion of Basic Science Teachers on the Curriculum)	Mean
1	Generally the curriculum of Basic Science is suitable	3.37
2	Teaching of basic science is easy	2.40
3	The course content of Basic Science can be covered within the stipulated time	2.15
4	Basic Science teaching aids are not available	2.00
5	Laboratories are available in my school and also adequate for teaching Basic Science	2.56
6	I can only teach those aspects of basic science concepts related to my subject area of specialization effectively	2.66
7	I can develop Basic Science test items only in those aspects that relate to my subject area of specialization	2.80
8	I am always able to improvise materials for teaching basic science	3.45
9	Basic science provides strong basis for learning physics, chemistry and biology	3.74
10	I am able to plan lessons in all aspects of Basic Science	3.33

Any mean score above 2.50 is considered agree. From the above table, 70% of the items were agreed upon by the basic science teachers and 30% of the items were disagreed upon.

HYPOTHESES

Hypothesis 1

The basic science teachers experiences on curriculum content are significantly independent of their sex at 0.05 level of significance.

Table 10: Observed Rated Frequencies and Computed Expected Frequencies of Male and Female Teachers on Their Opinions

Sex		Opinions				
		SA	A	D	SD	Total
Male	Fo	30	34	26	10	100
	Fe	28.88	34.54	26.12	9.42	
Female	Fo	20	36	24	20	100
	Fe	21.12	35.42	13.88	20.58	
Total	Fo	50	70	50	30	200

Fo   =   Observed frequency

Fe   =   Expected frequency

Table 10 above presents the average observed rated frequencies and computed expected frequencies of the Basic Science teachers based on their sex. The calculated value of x^2 based on sex is 0.62 while the table value of x^2 at 0.05 level of significance at 3 degrees of freedom is equal to 7. 83.

From the above result, the computed x^2 value for sex of Basic Science teachers are not statistically significant at 0.05 level of significant at 0.05 level of significance. In view of this result, we do not reject the hypothesis.

Hypothesis 2

The Basic Science Teachers opinions on curriculum content are significantly independent of their subject Area of specialization at 0.05 level of significance.

Table 11: Average Observed rated Frequencies and Calculated Expected Frequencies Based on subject Area of Specialization of the Basic Science Teachers.

Subjects		Opinions				
		SA	A	D	SD	Total
Biology	Fo	24	34	22	15	95
	Fe	24.30	33.65	22.10	14.95	
Chemistry	Fo	10	13	9	7	39
	Fe	9.94	13.17	9.18	6.71	
Physics	Fo	10	14	10	7	41
	Fe	10.46	14.03	9.62	6.89	
Others	Fo	7	7	6	5	25
	Fe	6.30	7.15	6.	5.45	
Total	Fo	51	68	47	34	200

Table 11 above presents the average observed rated frequencies of the opinions on curriculum contents of Basic Science teachers based on their subject Areas of specialization. The calculated value of $x^2 = 0.75$ at 3 degrees of freedom based on subject area of specialization, while the table value of x^2 at 0.05 level of significance at 3 degrees of freedom = 7.83.

From the above result, the computed x^2 value of the opinion of the Basic Science teachers based on their subject area of specialization are not statistically significant at 0.05 level of significance. Based on this, we do not reject the hypothesis.

DISCUSSION

The results from the observatory scale show ed that the performance level of the basic science teachers on topic and curriculum, preparation and introduction methodology and teaching aids and evaluation/summary are average in performance level. On classroom management and students participation, they showed averaged performance level expect in three specific skills namely ability to arrange the class in order of height, ability to control unnecessary movement in the class where their performance level was average.

Generally, even though their performances were average in all the skills, they performed poorly in (1) ability to device methods for students to use in evaluating their own progress (1.68), (2) ability to stimulate students to ask questions during practicals (1.93) (3) ability to develop test blue print which relates the objective to course content and specifies the emphasis to be given to each type of outcome (1.89), (4) ability to evaluate individual assignment under direct study (1.83).

The ability to follow Basic Science curriculum in sequence, the ability to select topics according the basic science curriculum, planning and introduction, selection and use of methods and materials, summary and evaluation are very essential in realization of the objectives of a plan. It is at the planning and introduction phase that the teacher outlines in advance, what their instruction, procedures and resources that will enhance his effectiveness. At this phase also, likely difficulties and ways of overcoming them are anticipated in advance of the actual lesson. Such advance preparations can influence in no small measure.

The findings suggest that a little performance level in classroom management and students participation, summary and Evaluation may be a potent factor associated with lack of qualified Basic Science teachers. The findings also showed that most of the teachers used lecture and demonstration methods in teaching. It was also found that the Basic science teachers approach Basic science in biology aspect. The reason was found to be due to the arrangement of their scheme of work which biology concepts were supposed to be in progress during the period of this research.

From the hypotheses, hypothesis one revealed that the calculated x^2 value for sex was 0.62. This is not statistically significant at 0.05 level of significance at 3 degrees of freedom considering the x^2 value of 7.83. In view of this, we do not reject the hypothesis. This implies that there is agreement between the sex of the basic science Teachers on their experiences. In other words, sex does not affect the Basic science teachers classroom experiences.

This finding is consistence with Olarewaju and Balogun (1984) in Omiko (2015) who found that sex among other variables did not influence the attitude of Basic science teachers towards the Nigerian integrate science project (NISP). Also Obioma and Ohuche (1984) in Omiko (2015) found that sex is not a significant factor in the perceptions of Nigerian J.S.S. Students interest in integrated science.

In hypothesis two, the computed x^2 value of the opinion of the Basic Science Teachers on curriculum content of Basic Science based on subject area of specialization was 0.75. This is not statistically significant at 0.05 level of significance at 3 degrees of freedom considering the table x^2 value of 7.83. Based on this, the above hypothesis was not rejected. This implies that there is no difference among the teachers due to subject area of specialization. In other words subject area of specialization does not affect the experiences of Basic Science teachers.

RECOMMENDATIONS AND CONCLUSION

The serving Basic science teachers in the three Education zones in Ebonyi state have been found to demonstrate low level of performance in classroom management and students participation, evaluation and summary while exhibiting an average level of performance in topic and curriculum, preparation and introduction, methods and teaching aids. This result indicates that these teachers need improvement in their levels of performance in these skills. Therefore;

(a)   Serving Basic Science teachers need to be provided with some opportunity for the improvement of their instructional skills. Such opportunities may take the form of workshops and seminars or conferences where proficient and experienced teachers serve as coaches or trainers.

(b)   The Ebonyi state Ministry of Education and the Universal Basic Education Board (UBEB) should provide basic instructional materials to all the Junior Secondary Schools especially those ones in the rural areas since there is evidence that teachers make good use of the available ones. Special attention should be paid to the younger schools or newly established junior secondary schools which seem to have a more acute need of them.

REFERENCES

Abdullahi, A. (1982). *Science Teaching in Nigeria*: Iicorin: Atoto Press Limited.

Akpan, B.B. (2015). The place of Science Education in Nigeria for Global Competitiveness. *Journal of Science Teachers association of Nigeria (JSTAN) 50(ISSUE 1)* 1-23.

Anackwe, M.C., Nzelum, V.N., Olisakwe, and Okpala, J.U. (2010). *Principles and methods of science education*. Onitsha, sofie Publicity Ltd.

Federal Republic of Nigeria (FRN, 2004) *National Policy on Education.*

Igwe, I.O. (2003). *Principles of Science and Science Teaching in Nigeria. (An Introduction)* Enugu; Jones Communications Publishers.

Ivowi, M.U.O. and Akpan, B.B. (2012). Education in Nigeria from the beginning to the future. A book of reading in honour of Prof. O.C. Nwana. Lagos: Foremost Educational Services Ltd.

Nwafor. C.E. (2012). Comparative study of students Academic Performance in J.S.S Certificate in Basic Science in Public and Private Secondary School in Ebonyi State University, Un-public Lecture notes.

Nworgu, B. G. (1986). *Proficiency of Secondary School physics Teachers in application of instructional skills during physics lessons.* Nsukka, Unpublished M.Sc. Ed. Thesis, University of Nigeria (UNN).

Oka, B.O. (2015). *Effects of computer Assisted Instruction on the Achievement of Junior Secondary School Students' in Basic Science.* Unpublished B.Sc.Ed Project Abakaliki, Ebonyi State University.

Omebe, C.A and Omiko, A. (2015). Effect of Instructional Resources on students' Achievement in Physics in Secondary Schools in Ebonyi State, Nigeria. *Journal of the Science Teachers Association of Nigeria (JSTAN).* 50 (Issue 1) 174-183.

Omiko, A. (1987). *Evaluation of classroom experiences of Integrated Science Teachers.* Unpublished B.Sc. Ed. Thesis, Nsukka, University of Nigeria, U.N.N.

Omiko, A. (2005). Science and Technology: Imperative for African Development in the twenty first Century. *Journal of African in a New World Order.* 2(1) 107-114

Omiko, A. (2012). Science and Technology Education curriculum and Entrepreneurship skills Acquisition at the Senior Secondary levels: Problems and Prospects. *Journal of the Curriculum Organiation of Nigeria* (CON) 19(2) 101-109.

Omiko, A. (2014). *Identification of the factors that influence teachers use of strategies in effective teaching of chemistry in secondary schools in Ebonyi State of Nigeria.* Unpublished Project. Abakaliki, Ebonyi State University.

Omiko, A. (2015). Impact of Instructional Scaffolding on Students' Achievement in Chemistry in Secondary schools in Ebonyi State of Nigeria. *International Journal of Education Learning and development.* 3(7) 74-83, Editor.ijeld@ea-journals.org

Omiko, A. (2015). Laboratory Teaching: Implication on students' Achievement in Chemistry in secondary Schools in Ebonyi State of Nigeria. *Journal of Education and Practice. 6(30)* 206-213, http//iiste.org/journals/index.php/jep/issue/view/21.

Ukpabi, A. (1985). *Pre-service Science Teachers Perception of Integrated Science in Owerri Local Government Area of Imo State.* Unpublished PGDE Thesis UNN.

UNESCO: (1973). *New Trend in Integrate Science.* UNESCO: Paris