INTERNATIONAL JOURNAL OF INNOVATIVE RESEARCH & DEVELOPMENT

ISSN 2278 – 0211 (Online)

An Assessment of Teaching and Evaluation Methods Used in the FCT Basic Education Schools

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Abstract:
This study investigated science teaching and evaluation methods used in the Federal Capital Territory (FCT) Basic Education Schools. The sample was made of 54 students, 37 teachers, 16 school head teachers drawn from these Schools located in three Local Government Council Areas of the, Abuja. Forty-eight male and Fifty-nine female respondents were drawn from private and public schools. A total of 107 respondents formed the sample used for the study. The study adopted survey research design in which three sets of questionnaires, for the students, for the teachers and for the Principals/Head Teachers that were involved in the study. The research questions were answered and data collected for the study were analyzed using frequency counts and percentages. Results revealed that most schools poorly implemented procedures like Guided Discovery, Concept-mapping, Individual projects, and Group works/assignments. A number of recommendations for ameliorating the astonishing and disturbing situation present were offered.

Key words: *Assessment, Basic Education, Evaluation Procedures, Teaching Methods, Tests/Instruments*

1. Introduction

A lot of changes have taken place in Nigerian Education over the years as educational planners and subject teachers have tried, sometimes with doubtful success, to keep pace with the galloping dynamism in the contemporary world of science, technology and informatics. In Nigeria, the National Policy on Education stipulates that secondary school education should equip students to live effectively in modern age of science and technology (Federal Ministry of Education - FME 2004). The proper teaching and handling of science and technology subjects in schools by qualified hands will result in the training of the minds of students in the understanding of the world around them in the acquisition of appropriate skills, capacities, competencies necessary for them to live and contribute to the development of their society. In pursuance of this, governments of many nations have planned that scientific and technical subjects should be taught in such a way as to ensure that every secondary school student has access to science and technology irrespective of sex and creed.

In Nigeria for example, as a follow up of the Adebo commission, the 6-3-3-4 system of education was put in place. The three year junior secondary school education took care of pre-vocational subjects while the three year senior secondary catered for sciences and vocational subjects (Oriaifo 2002), in NERDC (2008). According to Salau & Adebayo (2010), Nigeria as a nation has taken some shots at education reforms since the return of the Country to the democratically elected government in 1999, to fight the deterioration in the education system which have spanned a long period of time, but became more pronounced within the last decade.

There is no single method which can be regarded as best for every teaching situation. Ada (2005) reported that there are a number of criteria available that may guide the teacher in the choice of any given method of teaching which include: the content to be taught, objectives to be achieved, time available, the number of students, teachers' preferences and individual differences, the type of lesson, facilities available, needs and interest of the class, among others. It has also been reported by Mtsem (2011) that teaching method affects the responses of students and determines whether they are interested, motivated and involved in a lesson in such way as to engage in a good learning. What constitutes good teaching and learning of school subjects is the use of appropriate methods of teaching. Ogunniyi (2009) asserted that one of the most persistent and compelling problems besetting achievement in Nigeria is the poor quality of teaching. This fall in standard of performance at post primary level is incontrovertibly attributable to pedagogical approaches adopted by teachers in schools.

It has been reported that learning and understanding of school subjects have been frustrated by the clumsy methods and instructional materials used (Etukudo, and Utin 2006). To support this assertion, Salau (2009), as cited in Emaikwu, (2012), submitted that many researchers have adduced that poor performance in public examination is traceable to teaching techniques by teachers. The resultant effect is the low achievement and low retention level in students' outcome both in internal and external examinations. Sequel to this,

there is a wide spread concern among parents and considerable public about the methods used in teaching at the secondary school level especially sciences in Nigeria.

1.1. Teacher's Use of Teaching Methods

The method employed by the teachers in an attempt to impact knowledge on the learners is referred to as methodology. Omotosho (1991) sees teaching method as the strategy or plan that outlines the approach that teachers intend to take in order to achieve the desirable objectives. It involves the ways teachers organized and use techniques of subject matter, teaching tools and teaching materials to meet teaching objectives. Fafunwa (1970), as cited in Akinfe E, Olofinniyi O.E, and Fashiku C.O (2012), said most untrained teachers point accusing fingers at students rather than on themselves when the students are unable to carry out the expected behaviour at the end of the lesson or examinations. Therefore teachers' plan should include:

- Choice of appropriate teaching method
- Choice of appropriate teaching materials
- Intensive research on the topic to be taught
- Determination of the objectives for the lesson

Koffinan (1980) and Ferguson (1992) carried out studies on the effect on instructional methodology and students' performance. These instructional methods they referred to as technical skills of teaching. At the end of the study, they found out that only effective method(s) of teaching can bring about effective learning, hence teachers creative and dynamic in this regard to ensure that there is an increase in average students' performance in their subject areas.

2. Different Methods of Teaching

- Discussion: Students talking to each other and sharing their ideas either in small groups or as a class. Teacher may or may not take part.
- Demonstrations: Teacher showing a skill to the students while they watch.
- Practicals/field work: All or some of the students practicing a skill which they have learnt or are learning.
- Experiments/Lab teaching: These are related to practicals and are mainly used in science-related subjects, including Agriculture and Home Economics or Life Skills. Students are asked to do something, observe and record the results of what they do, and try to explain these. Sometimes the teacher may do an experiment as a demonstration.
- Lecturing: Teacher telling the students information or ideas while they listen.
- Note-giving: Writing notes on the board for students to copy or giving handout for students to read.
- Questioning: Teacher asking questions to individuals or whole class.
- Brainstorming: Students asked to throw out as many ideas as possible in a short time either in groups or whole class. Usually someone writes the ideas down.
- Seminars: One student asked to present a topic or teach a skill to the rest of the class. They must prepare this in advance.
- Group/Team work: Students work in groups on an activity. This may include making something; looking after a garden; or finding out about a particular topic. This may be for one lesson or for a group project lasting days or weeks.
- Guided Discovery Strategy: is activity oriented and involved practical demonstration, discussion and experimentation. During such instruction the students employed the processes of science like observation, classification, investigation and critical interpretation of findings.
- Other methods: Case-based teaching, Clinical teaching, Online teaching, Service learning, teaching with archival, botanical, and museum collections.

The rational for science teaching shifted as discovery strategy was adopted worldwide, this was because students tended to memorize facts and concepts, most of which they did not understand. This resulted in a lack of retention and application of concepts and there was a great burst of interest as the guided discovery strategy was adopted in the Nigeria Curriculum. (Okoye, 1998 and Nwagbo, 2001). Also, Okebukola (2002) and Okoye (2002) believe that learning is known to take place not only through observation alone but also through organization, structuring and reconstructing of concepts. They also believe that today, students' aversion towards key science concepts is on the increase and it is possible for guided discovery strategy of teaching to be enhancing students' performance. This is because of the activity-oriented nature of the guided discovery strategy. Moreover, most science teachers in Nigeria tend to be at home with the guided discovery strategy being relativity oriented with its process approach to science teaching.

At the same time, the Concept Mapping strategy is relatively new in Nigeria and a number of teachers both professionals and non-professionals were yet to be at home with the strategy. A concept according to Kola--Olusanya (1997) is regularity in even or objects designated by some label. "Wind" for example is the label used for the event that involves air in motion. Mapping activities require the student to think in multiple directions and to switch back and forth between different levels of abstraction before a meaningful concept map can be shown. Hence these mapping exercises and elicitation of prior knowledge of concept accounted for better achievement.

This implies that this newly introduced concept mapping strategy in teaching needs to be popularized among science teachers through workshop seminars and other in-service training procedure so as to pass the significant advantages of this teaching method to all category of teachers. Concept mapping instruction involves class discussion, practical demonstration and concept mapping activities. During such lessons, concepts are organized in a hierarchical manner, and related concepts linked in such way as to make learning meaningful through logical interpretation of individual experiences.

3. Evaluation

Evaluation is the act of considering or examining something in order to judge its value, quality, importance, extent or condition. Ifamuyiwa (2006) defines evaluation as a process of gathering valuable information on attainment of educational objectives, analyzing and fashioning information to aid judgment on the effectiveness of teaching or an educational programme. Evaluation is the process, whose duty is the systematic and objective determination of merit, worth, or value. Without such a process there is no way to distinguish the worthwhile from worthless. This process involves two dimensions: (a) Gathering data and (b) using the data for judgment and decision-making with respect to agreed standards.

According to (Joshua and Bassey, 2004), Evaluation is a household word in the field and practice of education, and has been variously defined. A generic definition is that it is the systematic process of judging the worth, desirability effectiveness or adequacy of something according to definite criteria and purposes. The judgment is based on a careful comparison of observation data with criteria standards. It can also be said to include systematic collection of information for use in judging the worth of a programme, product, procedure, or objective; or the potential utility of alternative approaches designed to attain specific objectives. The various definitions of evaluation in the literature have indicated that good evaluation should involve three fundamental processes.

- The formulation or identification and acceptance of specific and verifiable values, goals and objectives.
- The securing of specific evidence relative to the existence, quantity and quality of a condition or process.
- The act of making a judgment, in the light of available evidence, concerning the extent to which the desired values/goals/objectives have been attained.

Joshua et al (2004) gives the following as the major purposes of educational evaluation:

- To aid in planning;
- To aid in decision-making on the daily administration of the programme;
- To upgrade programme personnel as such needs arise,
- To improve the programme for student beneficiaries, and
- To ensure the accountability of expenditure to both internal and external publics and sponsors;

4. Types of Evaluation and Evaluation Procedures

4.1. Formative evaluation

The term *formative* indicates that data is gathered during the formation or process of the teaching (before the end of term/session, so that revisions to it can be made. In formative evaluation, teachers would evaluate the match between the instructional strategies and materials used, and the learning outcomes or what it aims to achieve.

4.2. Summative Evaluation

The term *summative* indicates that data is collected at the end of the implementation of the instruction/programme. Summative evaluation can occur just after new course materials have been implemented in full (i.e. at the end of the term/session), or several months to years after the materials have been implemented in full. Teachers should want to know if learners achieved the objectives or whether the programme produced the desired outcomes. Also, the major uses of educational evaluation as

- Appraisal of academic achievement of individual pupils
- Diagnosis of learning difficulties of individual pupils or entire classes;
- Appraisal of educational effectiveness of curriculums, instructional materials and procedures, and organizational arrangements;
- Of the educational progress of large populations so as to help understand educational problems and develop sound public policy in education. Thus, evaluation of secondary schools is very complex and involving. (Alonge, 2003).

It requires a critical assessment of the objectives to being pursued in the schools, the curriculum that is being implemented, the quality and the needs of the learners being admitted into the system, the quantity and quality of the facilities and teaching-learning resources available to the teachers and learners, the personnel that are implementing the programme - largely the teachers in the terms of their qualifications, competencies, job effectiveness, orientations, adequacy of training/preparation and needs; the students/learners - in terms of the changes that are taking place in them, if any – the knowledge, skills, competencies, attitudes, values and other desired and unintended psychomotor/affective outcomes, the instructional processes in terms of their effectiveness in producing the desired results, the administrative machinery – in terms of its effectiveness and efficiency in harnessing the available resources.

The role of parents/guardians/sponsors of learners, and the role of industries, enterprises, corporate citizens and the society at large in terms of the supportiveness and conduciveness of the environments (physical , social and psychological) in fostering “character and learning” in the products of secondary schools; and also the sincerity, willingness and capabilities of the various governments, missions, communities, agencies or proprietors, owning and running secondary schools.

4.3. Evaluation Procedures

Some of the Evaluation Procedures being used in Nigeria are: Class works/assignments, Home works, Class tests, Quizzes, Individual projects, Group projects, and Group works/assignments among others. It is noted that assessment or evaluation of secondary school education in Nigeria is rather complex, involving and costly, yet it is also noted that such exercise/project or venture is very important and crucial to the maintenance and sustainability of standards in our nation’s secondary schools. It is a sine qua non; and the relevant

bodies must rise up to the challenge to meet up with the demands of political will, substantial funding and the quest, resolve or vote for excellence in our secondary schools.

This study is designed to assess the Teaching and Evaluation Methods Used in the FCT Basic Education Schools bearing in mind that choice of methods or strategy in teaching is a function of many variables among which are teachers' knowledge, ability and bias which are indices of teachers' quality used in this study. In the search for methods of improving science instruction, researchers have come up with strategies based on the restructuring of knowledge by the learner from their individual experience.

5. Statement of the Problem

There has been a drastic reduction in the standard of performance by students at all levels of education in Nigeria in the past decades. The fall in the standard of education in Nigeria is traceable to many factors which are rooted in psychological, physiological or environmental factors. Many persons seem to be perplexed as to what factors are actually responsible for the fall in standard of students' performance in schools. This puzzled state has eventually led many to attribute the fall in performance to: poor condition of service for teachers; lack of qualified teachers; inadequate supply of facilities and equipment; lack of motivation, lack of instructional materials; and wrong method of teaching (Emaikwu & Nworgu, 2005; Onah, 2012 & Emaikwu, 2012) as cited in Emaikwu (2012).

The resultant effect is the low achievement and low retention level in students' outcome both in internal and external examinations. Sequel to this, there is a wide spread concern among parents and considerable public about the methods used in teaching at the secondary school level especially of Sciences in Nigeria.

In choosing a teaching method for various lessons, the teacher should consider the following:

- What the goals are for each level of learner (knowledge, skills, and attitudes/values) for today and for the rotation.
- How to actively engage as many learners as possible.
- Which methods best display the content of the session.

The question each and every one of us should ask is 'what is it in our schools that make students fail or cheat?' The answer to this question probably centres on the mode of teaching as well as evaluation and examination procedures.

6. Objectives of the Study

The general objective of this study is to assess the teaching and evaluation methods used in the FCT Basic Education Schools. The specific objectives of this study are therefore to:

- Assess the Qualifications of Teachers teaching Sciences in FCT Basic Education Schools.
- Identify the type(s) of teaching method(s) commonly used in FCT Basic Education Schools.
- Identify the type(s) of evaluation procedure(s) commonly used in FCT Basic Education Schools.

7. Research Questions

Answers will be sought for the following questions which are specifically formulated to guide the study:

- What is the level of Qualification of Teachers teaching Sciences in the FCT Education Schools?
- What type(s) of teaching method(s) is/are used in FCT Basic Education Schools?
- What type(s) of evaluation procedure(s) is/are used in FCT Basic Education Schools?

8. Methodology

8.1. Research design

This study adopted a survey research design. This was because a large sample had to be drawn from the target population, study its characteristics and generalize the results obtained from the sample on the population. The survey nature of the study was also reflected through presentation of the status of Teaching methods and Evaluation Procedures being applied by Teachers in Nigerian Basic Education Schools.

8.2. Population and Sample

The target population of the study comprises all primary and junior secondary school teachers and Students in the Federal Capital Territory. Since it was not feasible to reach all the Nigerian primary and junior secondary teachers owing to financial and logistic constraints, a representative sample of the population had to be used.

The respondents for the study were randomly chosen from three (3) local Government Area Councils, the sample was made of 54 students, 37 teachers, 16 school principals and head teachers drawn from primary and junior secondary schools located in three randomly selected Local Government Council Areas of the Federal Capital Territory, Abuja. The subjects were drawn from both private and public schools and were made up of 48 male and 59 female respondents. In all, a total of 107 respondents formed the sample used for the study.

8.3. Instrumentation

A well designed and structured instrument tagged "Teaching and Evaluation Methods in Basic Education Schools Questionnaire (TEMBESQ)" was developed and used for the study to elicit information from the respondents. The draft of the instrument was first

subjected to face and content validity by two Experts of Measurement and Evaluation. Recommended amendments were duly effected and with these amendments, the instrument was considered suitable and ready for field administration.
Three sets of questionnaires, each made up of 3 sections were developed. The first questionnaire was for the students, the second for the teachers while the third was for the Principals and Head Teachers.
Section A require each respondent, - the Students, Teachers and Heads of school to supply the background information about himself or herself and the school where he/she is teaching/schooling, including gender, educational background, years of teaching experience, area of specialization and classes taught, where applicable. Section B solicits for information on their perception on teaching methods and Evaluation procedures and practices in schools.
Section C called for suggestions of some other type(s) of Assessments/Tests/Instruments commonly used in their Basic Education Schools for the successful implementation of the computer studies curriculum at the basic education level, as well as to how to overcome the identified constraints for effective implementation of the curriculum. The reliability indices of 0.87, 0.79 and 0.75 were obtained for the students', teachers' and schools' heads questionnaires, respectively.

8.4. Data Collection and Analysis
The administration of the validated instruments was carried out on the selected respondents by the researcher and her research assistants. The data collected for the study were analyzed using descriptive statistical methods involving frequency counts and percentages.

9. Results and Discussion

9.1. Research Question (RQ) 1. What is the level of Qualification of Teachers teaching Sciences in the FCT Basic Education Schools?
Table 1 shows the frequency and percentage distributions of sampled science teachers based on qualification, teachers were grouped into professional and non-professional. Professional teachers are those with teaching qualifications (NCE, B.Sc. (Ed.), PGDE and M.Ed.) relevant to the subject under study while those with ND, HND, B.Sc and M.Sc. in sciences and any other subjects are regarded as non-Professional teachers.(See Table 1)

Respondents	**Qualification (No=53)**	
Level	**Professional (%)**	**Non-Professional (%)**
Primary School (24)	(75.0)	(25.0)
Junior Secondary School (29)	(53.8)	(46.2)

Table 1: Frequency and Percentage Distributions of science Teachers by Qualification
Figures in parenthesis represent the percentages of the indicated quantities

A perusal of Table 1 shows that some of the teachers saddled with the teaching of sciences are not qualified to handle the subject they profess to teach. In particular, over 24% and 46% of the teachers are not qualified to handle the subject at Primary and Junior Secondary Schools, respectively. A further scrutiny of the data revealed that a well over 20% of these unqualified teachers at the Primary school level specialized in non-science related subjects such as Social Studies, Christian Religious Studies, and languages, among others. A similar statistics was also recorded at the Junior secondary school level where such teachers accounted for only 22% of the unqualified teachers. A comparison of the quality of teachers by proprietor of schools present another angle to the observed gloomy picture, by a way of comparison, the quality of science teachers was low in private schools.
The qualification of teachers as observed in this study poses a serious threat to the effective curriculum delivery. When the teacher is not sufficiently trained, his/her effectiveness, efficiency and creativity will be greatly hampered (Eshiet, 1996) as cited in Salau et al, 2010). The inadequacy of the right calibre teachers in our private school owners might be entertaining the fear of depleting their profit margin if well qualified teachers are employed. The situation might be further aggravated by the present global economic meltdown. Needless to say that "no education system can rise above the quality of its teachers" (Federal Republic of Nigeria, 2004), the astonishingly disturbing difference in the quality of teachers in public and private schools leaves much to be desired.

9.2. RQ 2. What type(s) of teaching method(s) is/are used in your school?
The situation is slightly better in some the private schools where most of the Respondents sampled reported that they use some/most of the teaching methods in their schools, although the public schools are better in the use of some of the teaching methods like: Note-giving, Demonstration, and Stimulation/Games with 85.7%, 79.6%, and 39.7% responses levels respectively. The data for public schools revealed that the Respondents were over 90% in agreement with the use of Group-Activity. The data revealed that the least used teaching methods include: Guided Discovery, Role play, Dramatization and Concept-mapping. (See Table 2)
Table 2 shows Responses to functionality of Teaching Methods in schools

Teaching Methods and Strategies	Private Schools (49). %	Public Schools (58). %	All Schools= 107(%)
Group activity	85	85	91(85)
Guided Discovery	22.4	26	28(26.2)
Lecture	79.6	77.6	84(78.5)
Note-giving	85	85.7	84(78.5)
Demonstration	77.6	79.6	84(78.5)
Field trip	85.7	65.3	81(75.7)
Project	45	34.7	41(38.3)
Discussion	84	74	84(78.5)
Role play	26.5	22.4	28(26.2)
Dramatization	26.5	22.4	28(26.2)
Stimulation/Games	38.8	39.7	42(39.3)
Experiment	46.9	44.8	49(45.8)
Concept Mapping	13.3	11	14(13.1)

Table 2: Responses to functionality of teaching Methods in schools

9.3. RQ 3. What type(s) of evaluation procedure(s) is/are used in your school?

According to table 3***, the respondents were also requested to indicate whether the recommended evaluation procedure(s) is/are being used in their schools or not. It is very shocking to report that at the time of this study in 2013, in both public and private schools indicated that the existing procedures in use in schools are not really including Quizzes, Individual projects, Group projects, and Group works/assignments which are also reliable evaluation. Tables 2 and 3 also revealed that respondents in public schools reported that there were very poor implementation of procedures like Individual projects, Group projects, and Group works/assignments.

Table 3 showing Responses to functionality of Evaluation Procedure(s) in schools.

Evaluation Procedure(s).	Private Schools (49). %	Public Schools (58). %	All Schools= 107%
Class works/assignments	78.6	77.6	78.5
Home works	81.6	77.6	79.4
Class tests	73.5	91.4	83
Quizzes	34.2	32.8	32.7
Individual projects	20.4	19	19.6
Group projects	38.8	26	39.3
Group works/assignments	36.7	24.1	39.3

Table 3: Responses to functionality of Evaluation Procedure(s) in schools

10. Conclusion

Most untrained teachers point accusing fingers at students rather than on themselves when the students are unable to carry out the expected behaviour at the end of the lesson or examinations. Teachers' plan should include: Choice of appropriate teaching method, Choice of appropriate teaching materials, Intensive research on the topic to be taught and determination of the objectives for the lesson. Only effective method(s) of teaching can bring about effective learning, hence teachers creative and dynamic in this regard to ensure that there is an increase in average students' performance in their subject areas.

Good evaluation should lead to encouraging and promoting improvement of whatever (or whoever) is being evaluated – if it is *formative*; and should also lead to sound and appropriate terminal decisions – if it is summative. It should also be continuous, comprehensive, cumulative and conclusive (Calhoun & Finch, 1982, Gronlund, 1985; Joshua, 1998b; Wentling, 1980 as cited in Joshua, 2004). Evaluation in education (or educational evaluation) is the systematic process of determining the effectiveness of educational endeavours in the light of evidence. The view of evaluation in education is directed at examining the achievement of objectives in the classroom, and testing to compare students' performance in school subjects.

It was concluded in this study that, Guided Discovery method and the concept mapping strategy have the potencies to improve the students' achievements. They are better than conventional lecture method, Note-giving, Discussion, etc, sometimes currently used to teach in the Basic schools Nigeria, and the latter need to be popularized among science teachers through workshop seminars and other in-service training procedure, as they encompass class discussion, practical demonstration and concept mapping activities, so as to pass the significant advantages of this teaching method to all categories of teachers. Also, Evaluation procedures like Individual projects, Group projects, and Group works/assignments should be encouraged in the Basic Education Schools.

11. Recommendations

On the basis of the findings, it was recommended that:

- Government should Endeavour to monitor the employment of Teachers so that only qualified teachers would be engaged in the Nigerian Basic Education Schools
- Teachers should change from, or use less of the conventional lecture and discussion methods to guided discovery and concept mapping strategy in teaching.
- The school principals should give necessary support to teachers for effective teaching and learning in secondary schools.
- The government should encourage and require teachers to use assorted and relevant methods like the concept mapping strategy in teaching through supervision and provision of ending environment to teach in secondary schools.
- The government should also organize on-the-job training, workshops, seminars symposia and conferences for the teachers of in secondary schools to update their knowledge on the application method of teaching, also, the concept mapping strategy needs to be popularized among science teachers through workshop seminars and other in-service training procedure so as to pass the significant advantages of this teaching method to all categories of teachers.

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