

Assessment of Senior Secondary School Biology Practical Activities in Ekiti State, Nigeria

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Abstract: *This study assessed practical activities in Ekiti State Senior Secondary School Biology lessons. The study specifically examined the extent to which school location affects the practical activities in the Biology laboratory. The study further examined the teachers' gender and utilization of Biology laboratory. The study adopted the descriptive research design of the survey type. The population of the study comprised of 19,603 Senior Secondary School II (S.S.S2) students and 378 Biology teachers in all 189 Public Secondary Schools in Ekiti State. The sample for this study was 490 respondents, comprising 450 Students and 40 teachers randomly selected from 18 secondary schools using multi-stage sampling technique. Three set of instruments tagged 'Biology Teacher Activities Questionnaire (BTAQ)', 'Biology Student Activities Questionnaire (BSAQ)' and 'Biology Equipment/Materials Checklist (BEC)' were used for the study. The three instruments BTAQ, BSAQ and BEC were validated by experts. Also the reliability of the three instruments BTAQ, BSAQ and BEC yielded reliability coefficients of 0.87, 0.79 and 0.68 respectively. The data were analysed using descriptive and inferential statistics. The descriptive statistics of frequency counts, percentages and means were used to answer research questions while the inferential statistics involving Pearson's Product Moment Correlation analysis and t-test statistics were used to test hypotheses, all the hypotheses were tested at 0.05 level of significance.*

The findings of the study showed that facilities for Biology practical activities were available in schools moderately. Also, the result showed that there was no significant difference between male and female teachers in conducting Biology practical. It was found that there was no significant difference between practical activities in rural and urban schools. The findings further showed that there was no significant relationship between teachers' participation and student participation in practical activities.

Based on the findings of the study, it was recommended that government in collaboration with Non-Governmental Organizations (NGOs) should ensure that resources are provided in the laboratory for effective practical. Also, periodic seminars and workshops should be organized for Biology teachers in order to enhance their effective practical activities and students' practical activities as stipulated in the Biology curriculum.

Key words: *Assessment, Practical Activities, Biology Laboratory*

1. Introduction

Biology as a branch of Science subject deals with the study of living things, it is one of the pre-requisite subject in the field of learning that contributes immensely to the technological growth of the nation, for example the knowledge of Biology is useful in the following areas, medicine, manufacturing and processing industry, food production, pharmaceuticals, biotechnology among others.

According to Nwakonobi (2008), the recent advances recorded in the field of Biochemistry, Physiology, Ecology, Genetics, and Molecular Biology are due to biological knowledge and application. The inclusion Biology as a core subject for science students in senior secondary school call

for the need to teach it effectively using practical activities. Its objectives as contained in the National Policy on Education (FRN,2013) includes among others to equip learners with meaningful and relevant knowledge of Biology, adequate laboratory and field skills. It is only through Biology practical activities in and outside the laboratory that the above objectives and goals can be achieved.

According to Score (2013),practical activities in science education are learning activities in which students observe, investigate and develop an understanding of the world around them, through direct often hand-on experiment of phenomenon or manipulating real objects and materials.Also practical activities can be defined to be any science teaching and learning activity which involves

student's working individually or in small groups, manipulating and /or observing real objects and materials as opposed to the virtual world (Science Community Representing Education, Score, 2008). Millar and Abraham (2009) reported that the main objective of the practical activities is to help students develop their knowledge of the world and their understanding of some of the main ideas, theories and models that science uses to explain it. Therefore the need to acquire new skills, new attitudes and new values for effective teaching of Biology in secondary schools cannot be over-emphasized, skills should be developed on how to handle practical activities in Biology.

Practical activities lessons improve students' skills in observation and creative thinking, successfully integrating practical activities with classroom lessons and field investigations will make the learning experience richer and more meaningful to students. Practical activities help develop students' understanding of scientific concepts. It aids memory and stimulates interest. Science practical activities are the aspect of science learning which is retained after cognitive knowledge has been forgotten, this concurs with a popular saying that 'what I handled I remember' because it has been established by researchers that an object handled impresses itself more firmly on the mind than the object merely seen from a distance in an illustration. Experimentation thus gives room for better attainment of lesson objectives.

Practical activities both in the classroom and outdoors are absolutely an essential component of effective science teaching, it enhances students' experience, understanding skills and enjoyment of science. It is often argued that practical activities are central to teaching and learning in science and that good quality practical activities help develop students' understanding of scientific concepts. Therefore Biology teachers should imbibe the tradition of practical activities in school science and value field work because majority of the topics in Biology cannot be considered as complete without including some practical lessons as it forms an essential part of learning experience for Biology students.

Many students tend to see Biology as abstract and irrelevant to their lives due to the fact that most teachers are not engaging the students in classroom practical activities and field work which aids the understanding of difficult concepts in the curriculum, it is believed that learners can achieve more if given the opportunity to carry out laboratory practical on what they have been taught in the

classroom. Experimentation thus gives room for better attainment of lesson objectives, since it depends on the availability of laboratory materials for proper learning, where it is impossible to procure adequate equipment/materials for teaching and learning, therefore Biology teachers need to wake-up to their responsibility by improvising when necessary.

The researcher's personal experience has shown that lack of necessary laboratory materials for the teaching of Biology in schools has resulted in making some aspects of Biology difficult for the students to comprehend, hence making the teaching of the main concept difficult. Students often times develop negative attitude towards the subject and this may lead to poor performance in Biology practical examinations and invariably affect the overall result of students in Biology subject during external examinations. Also it was observed that most Biology teachers defer practical activities until few weeks before external examination when students will be taught practical based on instruction to practical examination received from the examining body. Despite the fact that Biology curriculum stipulated that practical activities should be taught under each concept. Sometimes, the materials needed for these practical activities may be provided by the teachers or the students without any financial cost yet, they complained of lack of facilities as excuse for not doing practical Biology activities.

Taking parts in practical activities is an integral and essential part of learning sciences. It provides experience through which students can develop their understanding, enabling them to make the link between subject contents and the physical, as well as doing works by experiencing and observing phenomena. Practical activities teach techniques and skills for handling equipment and materials safely, as well as promoting the development of scientific reasoning so that students can understand through direct experience. Interest of students in Biology as a subject could be aroused through practical activities or exposing students into laboratory activities.

Researchers such as Aladejana & Aderibigbe (2007) and Watts (2013) have established that achievement and skills improved when students are taught science using practical work. However, the researcher observed that practical activities are not done in some schools in Ekiti State due to

inadequate resources, lack of practical skills among others.

Gender issues appear to play an important role in Science education, many differences between male and female have been documented by researchers. Opara (2011) opined that boys performed better than girls in Chemistry and Biology. Happem (2000) asserted that boys and girls have differentiated abilities, boys being superior in numerical aptitudes science reasoning while girls are superior in verbal fluency. Bello and Famakinwa (2014) showed that there are no significant differences in achievement and interest of male and female students in Biology that both male and female achieve equally in Biology when exposed to the same treatment and given equal opportunity. Practical skills should therefore be constantly developed in male and female students by the use of activity-oriented form of instruction. Lack of proper exposure to practical activities had been identified by researchers to be responsible for gender difference in teachers' inability to develop appropriate practical skills needed for Biology teaching.

Location of schools could also be a factor that affects Biology practical activities. Location is a particular place in relation to other areas. School location refers to the part of the state where schools are sited. It could be in an urban area where essential amenities are present for use or in rural where essential amenities may not be present for use. The students in urban areas are more likely to be exposed to practical activities in Biology than their rural area counterparts. Those schools located in urban towns are more likely to have better laboratories facilities, trained Biology teachers as well as more practical activities classes. This study therefore made an assessment of Biology practical activities in Ekiti State senior secondary schools considering availability and utilization of laboratory materials, gender and school location.

2. Statement of the Problem

Practical activities have been given a central and distinctive role in Science education. Despite the effectiveness of practical activities in teaching and learning process, it appears as if most teachers do not teach the students using practical activities, they complained lack of facilities as excuses for not doing practical in Biology. Oftentimes, the materials needed for practical activities may be provided by the teacher or the students in form of specimens without any financial cost yet they give excuses of lack of facilities. Perhaps, the teacher concerned do

not possess the skills or as a result of laziness, some even delay practical activities lessons until few weeks before external examination when practical activities will be based on instruction to practical examination received from examining body that is West African Examination Council (WAEC) and National Examination Council (NECO). The researcher's personal experience has shown that lack of necessary laboratory materials for the teaching of Biology in schools has resulted in making some aspects of Biology difficult for the students to comprehend, hence making the teaching of the main concept difficult. Students tend to develop negative attitude towards the subject and this may lead to poor performance in Biology practical examinations and invariably affect the overall result of students in Biology subject at various external examinations. This study therefore assessed Biology practical activities in some selected schools in Ekiti State, Nigeria.

3. Purpose of the Study

This study made an assessment of practical activities of senior secondary school Biology in Ekiti State, Nigeria. Specifically the study:

- i. examined the difference in the availability Biology laboratory materials between schools located in urban and rural areas
- ii. examined the difference in the utilization of Biology laboratory materials in rural and urban schools
- iii. examined gender difference in teachers' utilization of laboratory materials

4. Research Question

One research question was raised:

1. Are there available facilities for Biology practical activities in schools?

5. Research Hypotheses

The following hypotheses were formulated for the study:

1. There is no significant difference between male and female teachers in conducting Biology practical activities lesson
2. There is no significant difference between practical activities in rural and urban schools.
3. There is no significant relationship between teachers' participation and students' participation in Biology practical activities

5. Research Design

The research design for this study was descriptive research design of the survey type. This research design is considered appropriate because it describes the existing situation as regard Biology practical activities in Ekiti State public Senior Secondary Schools. The research is also a survey type because it covered a large area from which some schools were considered to be representatives of the entire group.

6. Population

The population for the study consisted of 19,603 Senior Secondary School students (S.S.2) II and all the Senior Secondary Biology teachers in all 189 public Secondary Schools in Ekiti State.

7. Sample and Sampling Techniques

The sample for this study was 490 respondents with 450 students and 40 Biology teachers selected from 18 randomly selected Senior Secondary Schools in Ekiti State, using multistage sampling procedure. Stage one involved selection of three Local Government Areas from each senatorial districts using simple random sampling by balloting. Stage two involved selection of two public senior secondary school from each of the Local Government Area using stratified sampling technique. Stage three involved the use of purposive

Table 1: Availability of Facilities for Biology Practical in Schools

S/N	ITEMS	AVAILABLE		NOT AVAILABLE		MEAN	REMARK
		F	%	f	%		
1.	Microscope	12	66.7	6	33.3	1.67	NA
2.	Hand lens	17	94.4	1	5.5	1.94	A
3.	Flat Bottom Flask	12	66.7	6	33.3	1.67	NA
4.	Prepared slides	8	44.4	10	55.6	1.44	NA
5.	Trough	10	55.6	8	44.4	1.56	NA
6.	Thermometer	16	88.9	2	11.1	1.89	A
7.	Dissecting board	10	55.6	8	44.4	1.56	NA
8.	Beakers	17	94.4	1	5.6	1.94	A
9.	Bell jars	11	61.1	7	38.9	1.61	NA
10.	Tripod Stand	18	100.0	-	-	2.00	A
11.	Slides	16	88.9	2	11.1	1.89	A
12.	Bunsen Burner	12	66.7	6	33.3	1.67	NA
13.	Insect bottle	12	66.7	6	33.3	1.67	NA
14.	Desiccators	7	38.9	11	61.1	1.39	NA
15.	Funnel	17	94.4	1	5.6	1.94	A
16.	Million's reagent	17	94.4	1	5.6	1.94	A
17.	Petri dishes	16	88.9	2	11.1	1.89	A
18.	Stop watches	10	55.6	8	44.4	1.56	NA

selection of science class in each school due to the fact that Biology as a subject is offered by students in science class. At stage four, Biology intact class was used from each school making a total of 450 students and 40 teachers used for the study.

8. Instruments

The study made use of three response instruments namely, 'Biology Teacher Activities Questionnaire (BTAQ)', 'Biology Student Activities Questionnaire (BSAQ)' and 'Biology Equipment Checklist (BEC)'.

9. Data Analysis

The data collected were analysed, using both descriptive and inferential statistics. The research questions were answered using frequency counts, percentages and mean scores, The research hypotheses 1 and 2 were tested using t-test, and hypotheses 3 was tested using Pearson product moment correlation analysis, All the hypotheses were tested at 0.05 level of significance.

10. Results

Question 1

Are there facilities for Biology practical activities in schools

19.	Test tube	17	94.4	1	5.6	1.94	A
20.	Storage bottle	11	61.1	7	38.9	1.61	NA
21.	Sudan III solution	18	100.0	-	-	2.00	A
22.	Fehling solution	16	88.9	2	11.1	1.89	A
23.	Iodine solution	14	77.8	4	22.2	1.78	A
24.	Aquarium	6	33.3	12	66.7	1.33	NA
25.	Dissecting Kit	11	61.1	7	38.9	1.61	NA
26.	Forceps	11	61.1	7	38.9	1.61	NA
27.	Botanical garden	7	38.9	11	61.1	1.39	NA
28.	Dropping bottle	13	72.2	5	27.8	1.72	A
29.	Filter Papers	16	88.9	2	11.1	1.89	A
30.	Quadrat	15	83.3	3	16.7	1.83	A
31.	Charts	16	88.9	2	11.1	1.89	A
32.	Insect Nets	16	88.9	2	11.1	1.89	A
33.	Dried fruits/ seeds	13	72.2	5	27.8	1.72	A
34.	Formalin	13	72.2	5	27.8	1.72	A
35.	Animal specimens	16	88.9	2	11.1	1.89	A
36.	Measuring cylinder	14	77.8	4	22.2	1.78	A
37.	Human Model	7	38.9	11	61.1	1.39	NA
38.	Skeleton	9	50.0	9	50.0	1.50	NA
39.	Cobalt chloride paper	7	38.9	11	61.1	1.39	NA
40.	Plant models	4	22.2	14	77.8	1.22	NA

A= Available, NA= Not Available

Table 1 presents the availability of facilities for Biology practical activities in schools. Using a grand mean of 1.70 for the rating scale, the result shows that 21 out of the items listed were available while 19 were not available. This is an indication that Biology practical facilities in Ekiti State schools were moderately available.

11. Hypotheses

Table 2: t-test of Biology Teachers’ Conducting of Biology Practical Lesson by Gender

Variable	No of teachers	Mean	SD	df	t	P
Male	17	35.06	3.98	38	1.826	0.076
Female	23	32.74	3.97			

$p > 0.05$

Table 2 shows that there was no significant difference between male and female teachers in conducting Biology practical classes ($t=1.826$, $p > 0.05$). The null hypothesis is not rejected. Hence, it therefore shows that there was no significant

There is no significant difference between male and female teachers in conducting Biology practical lesson.

In testing the hypothesis, scores relating to male and female teachers in conducting of Biology practical classes were computed using Items 1-20 in Section B of “Biology Teacher Activities Questionnaire (BTAQ)” and compared for statistical significance using t-test statistics at 0.05 level. The result is presented in table 2.

difference between male and female teachers in conducting Biology practical activities lessons.

Hypothesis 2

There is no significant difference between practical activities in rural and urban schools.

In order to test the hypothesis, scores relating to practical activities in rural and urban schools were computed using Items 1-20 in Section B of “Biology Teacher Activities Questionnaire (BTAQ)” and compared for statistical significance using t-test

statistics at 0.05 level. The result is presented in table 3.

Table 3: t-test of Biology Teachers’ Conducting of Biology Practical Lesson by School Location

Variable	No of teachers	Mean	SD	t	p
Rural	15	33.73	4.53	0.010	0.992
Urban	25	33.72	3.90		

p>0.05

Table 3 shows that there was no significant difference between practical activities in rural and urban schools (t=0.010, p>0.05). The null hypothesis is not rejected, therefore this implies that there was no significant difference between practical activities in rural and urban schools

Hypothesis 3

There is no significant relationship between teachers’ participation and student participation in practical activities.

In testing the hypothesis, scores relating to teachers’ participation and students’ participation in practical activities were computed using Item 1-20 in “Biology Teacher Activities Questionnaire (BTAQ)” and “Biology Student Activities Questionnaire (BSAQ)”. These scores were subjected to statistical analysis involving Pearson’s Product Moment Correlation at 0.05 levels. The result is presented in table 4.

Table 4: Pearson Product Moment Correlation of Teachers’ Participation and Students’ Participation in Biology Practical Activities

Variable	No of schools	Mean	SD	r	p
Teachers’ participation in practical activities	18	28.55	2.69	0.101	0.689
Students’ participation in practical activities	18	33.42	3.40		

p>0.05

Table 4 shows that there was no significant relationship between teachers’ participation and student participation in practical activities (r=0.101, p>0.05). The null hypothesis is not rejected this implies that there was no significant relationship between teachers participation and students participation in Biology practical activities.

facilities that were not available may be improvised, The teacher should try to improvise instructional materials and encourage students to do the same this gives student enough understanding of Biology concepts as the students’ local environment will be used to source the materials.

12. Discussion

The result of the study showed that there were available facilities (though moderately) for Biology practical activities in schools. This corroborated the findings of Uyoata (2006) which state that availability of resources makes the work of the teacher easy; it makes the lessons to be concrete simultaneously and helps to enhance the achievement of students. However, this negates the submission of Oludare, Abiodun & Ajayi (2006) that Biology laboratory physical structure as well as equipment is inadequate and Adesoji (2006) which stated that there are inadequate resources for teaching and learning of Science subjects in public secondary school in Nigeria. However those

Biology as a school subject is very important in scientific and technological development of a nation, Its objective as contained in the national policy on Education FRN (2013) include among others, to equip learners with meaningful and relevant knowledge of biology ,adequate laboratory and field skills. The use of equipment/materials in teaching biology is subject to its availability therefore materials/equipment must be available in order to make the objectives come to reality. Alebiosu and Michael (2018) opined that, certain facilities are most essential if school science laboratory is to be functional, relevant and productive. Apart from the adequacy of the laboratory human and material resources, there are required specifications for design of each of physics, chemistry, biology or any other science subject’s laboratory. Laboratory facilities are needed in

all its ramification for the purpose of achieving specific goals, and aid or facilities can be use for instructional process and development. It is therefore imperative for teacher to use instructional materials to make their teaching more interesting, effective, arrest and sustain more attention of the students for effective learning to take place. It is common knowledge that students do better through personal observation of objects or phenomena than hearing from a teacher alone, the laboratory practice is one of the best and most important instructional media for effective learning because it make real what is abstract in this wise ,students prefer experiments as it enable them to observe, classify and interpret result from concrete data laboratory practice, therefore practical activities is very important in biology lessons.

The finding showed that there was no significant difference between male and female teachers in conducting Biology practical classes. The finding negates the finding of Okeke (2007) who found gender influence on the attitude of male and female Biology teachers in the conduct of Biology practical activities. He asserted that male are said to be bold, strong, intelligent, logical in reasoning and self-confident while female on the other hand are said to be fearful, gentle, illogical in reasoning and dull. Also Nnaka and Ezekannagha (2014) according to them, Science is perceived by the society as male domain requiring a lot of intellectual ability which women are perceived not to possess. The findings also negates the submission of Ogunleye and Babajide (2011) which stated that, Science subjects are given masculine outlook by many educationist, this could be one of the reasons male science teachers continue to constitute the larger percentage of the population of science teachers in senior secondary schools. But in this study, both male and female teachers were found to utilize facilities equitably. Hence no significant difference between them.

The findings also showed that there was no significant difference between male and female teachers in conducting Biology practical lessons. This supports the submission of the researcher which states that gender difference should not be a barrier for utilization of laboratory materials in Biology but the skills and effective use depend on interest, competency, confidence and readiness among male and female teachers.

The finding showed that there was no significant difference between practical activities in rural and urban schools. The finding is at variance with the

findings of Ojaawo in Owoeye & Yara (2011) who posited that school location is one of the potent factors that can influence students' performance and distribution of educational resources. Also the findings was at variance with the opinion of Ayeni (2016), which stated that rural schools in Nigeria are generally regarded as schools located where the essential amenities may or may not be present for use on the other hand, urban schools are located where essential amenities are present for use.

The study further showed that there was no significant relationship between teachers' participation and student participation in practical activities. The finding is consistent with the finding of Agbenyeku (2004) which pointed out that one of the commonest errors observed in secondary schools is teachers' omission of laboratory activities and non-involvement in practical work as well as lack of participation of the students. Similarly, the findings also corroborated the opinion of Okoli (2006) who stated that science teachers prefer the traditional method of teaching technique in which one person, the teacher presents as spoken discourse on a particular subject and shy away from activity oriented teaching method which are student centred such as inquiry, discovery investigative laboratory approach.

13. Conclusion

Sequel to the findings of this study, it was concluded that equipment/facilities for Biology practical activities were available moderately inschools and these materials were moderately utilized in public secondary schools in Ekiti State Another conclusion that can be drawn from this study is that teachers and students' participation in Biology practical activities is not influenced by availability of laboratory materials in Biology; also it is not influenced by teachers' gender and school location.

14. Recommendations

Biology teachers should be encouraged to improvise instructional materials for the teaching of Biology practical when and where necessary.

School Principals' in conjunction with Area Education Officers in the Ministry of Education should regularly supervise teachers' practical activities and students practical activities as stipulated in the Biology curriculum.

Periodic and appropriate seminars and workshops should be organized for Biology teachers to enhance their effective use of practical activities for Biology Students

Government in collaboration with Non-Governmental Organizations (NGOs), Parents, Philanthropist, Old Students Association, should ensure that resources are provided in quality and quantity in the laboratory for effective Biology practical activities

References

- i. Adesoji, F.A. (2006) *Status of human and material resources for Nigerian Science and Technical Colleges: Issues and Challenges for STM Education*. 47th STAN Conference Proceedings, 8-13
- ii. Agbenyeku, U.E. (2004). *Effects of students' participation in practical Biology lessons on their learning outcome*. Unpublished M.Sc. Ed Thesis. Department of Science and Technology Education. University of Jos
- iii. Aladejana, F. & Aderibigbe, O. (2007). *Science laboratory environment and academic performance*. *Journal of Science Education and Technology*, 16 (6), 500-506.
- iv. Alebiosu, K.A. & Michael, E. (2018). *Towards optimal enhancement of practical work and activities in school science*. *Journal of Research in Science Education*, 2(1) 1-10
- v. Ayeni, M.F. (2016). *School variables as determinants of students' achievement in secondary Biology*. *Journal of Children in Science and Technology*, 10(1), 131-135
- vi. Bello, T.O. & Famakinwa, A. (2014). *Effects of gender on Basic Science practical skills of lower primary school pupils*. *Journal of Emerging Trend in Educational Research and Policies Studies*, 2, 78 – 90.
- vii. FRN, (2013). *National Policy on Education*. Abuja. NERDC press
- viii. Happem, D. (2000). *Sex differences: Cognitive ability* (3rd Ed). Mahwah, N.J
- ix. Millar, R. & Abraham, I. (2009). *Practical work: Making it more effective in schools*. *Science Research*, 91(334), 59-64
- x. Nnaka, C.V. & Ezekannagba, G.N. (2014) *Society's current attitude towards women in Science and technology based artisan jobs as a factor in mainstreaming girls into STM education*. *Journal of Science Teachers Association of Nigeria*. 49(1), 19-30
- xi. Nwakonobi, F.E. (2008). *Realizing the vision of National Economic Empowerment and Development Strategies (NEEDS) and millennium Development Goals (MDGS): Implication for Biology Education*. *Journal of Education* 8(1), 58-68.
- xii. Ogunleye, B.O. & Babajde, V.F. (2011) *Commitment to Science and gender as determinants of students' achievement and practical skills in Physics*. *Journal of Science Teachers Association of Nigeria*.s
- xiii. Okeke, C.A.C. (2007). *Making Science education accessible to all*. University of Nigeria 23rd Inaugural Lecture. University of Nigeria Press Ltd Nsukka.
- xiv. Okoli, J.N. (2006) *Effects of two interaction learning styles on students' achievement and interest in biology*. Unpublished phd thesis University of Nigeria Nsukka.
- xv. Oludare, O.T. Abiodun, O.S. & Ajayi, B.A. (2006). *The status of resources in secondary school teaching and learning in Lagos State, Nigeria*. *Proceeding of the 47th Annual Conference of Science Teachers Association of Nigeria (STAN)* Nzewi (Ed).
- xvi. Opara, J.A. (2011). *Some consideration in achieving effective teaching and learning in Science Education*. *Journal of Educational and Social Research*, 1(4)
- xvii. Owoeye, J.S. & Yara, P.O. (2011). *School location and academic achievement of secondary school in Ekiti State*. *Journal of Asian Social Science*, 7(15)
- xviii. SCORE, (2008). *Practical work in Science. A report and proposal for strategic framework*. Accessed from <http://www.score-education.org/about score>.
- xix. SCORE, (2013). *Resourcing practical Science at primary level*. Accessed from <http://Score-education.org/policy/curriculum/practical work in service>.
- xx. Uyoata, U.E. (2006). *Availability, selection and utilization of instructional resources for teaching primary Science in Uyo Local Government Education Authority, Akwa-Ibom State*. 47th STAN Annual Conference Proceedings, 38-44.
- xxi. Watts, A. (2013). *The assessment of practical Science: A literature review*. Cambridge Assessment.