JOURNAL OF SCIENCE, TECHNOLOGY AND EDUCATION (JSTE) VOL. 6. NO. 10

JSTE PUBLICATIONS, 2023 www.nsukjste.com/

ISSN: 2651-5539

AVAILABILITY AND ADEQUACY OF BASIC SCIENCE INSTRUCTIONAL MATERIALS IN GOVERNMENT JUNIOR SECONDARY SCHOOLS IN FEDERAL CAPITAL TERRITORY, ABUJA, NIGERIA

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Citation: Kareem. H. O. (2023). Availability and Adequacy of Basic Science Instructional Materials in Junior Secondary Schools in the Federal Capital Territory, Abuja. *Journal of Science, Technology, and Education (JSTE)*; www.nsukjste.com/ 6(10), 97-112.

Abstract

This study investigated the availability and adequacy of basic science instructional materials in Junior Secondary Schools in the Federal Capital Territory, Abuja. The study employed a descriptive survey research design. Two research questions and objectives, and one null hypothesis guided the study. A sample of 30 Basic Science teachers and 150 JS1 students were selected from 15 public Junior Secondary schools in 3 Area Councils (Abuja Municipal; Bwari and Gwagwalada) of the FCT using multi-stage random sampling techniques. A questionnaire was used as the instrument for the study and its reliability of content was validated by three experts within the Department of Science Technology and Mathematics in Nasarawa State University, Keffi. Data were collected using observation and two different questionnaires –one for the teachers and the other for the students. The data collected were analysed using statistical tools of mean and percentages and the null hypothesis was tested using chi square. The findings of the study revealed: low availability and inadequacy of Basic Science instructional materials in Public Junior Secondary schools in the FCT: Recommendations were made in reference to the findings.Hence, some recommendations such as: provision of instructional materials to schools according to their projected students' enrolment; all Public Junior Secondary school management should design effective measures of enforcing proper handling and maintenance of the Basic Science instructional materials by teachers and students; the FCT UBEB should ensure classrooms and Basic Science laboratories are adequate, well equipped and conducive; and teachers should be trained to improvise instructional materials where and when possible rather than complete abandon of a topic simply because the instructional materials are not available.

Keywords: Availability, Adequacy, Usage, Instructional Material and Basic Science.

Introduction

Science is generally explained as the intellectual and practical activity encompassing the systematic study of the structure and behaviour of the physical and natural world through observation and experiment. The word science brings to mind many different pictures to different people: a fat text book; white laboratory coats; microscopes; an astronomer peering through

telescope; a naturalist in the forest; Einstein's equations scribbled on a chalk board; the lunch of the space shuttle, bubbling beakers and so many other aspects of life. All of these reflect some aspect of science, but none of them provides a full picture of science because science has so many facets that cannot be easily captured by any single entity (Andrew & Michael, 2014). The relevance of Science in every facet of human society cannot be over emphasized. In the modern time, the rationale for science can be appreciated in different dimensions. Firstly, for the foreseeable future, science has a key role to play in helping reduce inequalities. Without basic science education, people are unable to participate fully as citizens. The second dimension is that basic school science introduces students to one of the greatest achievements of the modern world. (Onasanya & Omosewo, 2017).

According to Okpechi and Denwigwe (2017), Science education in general is to expose learners to the practical aspect of physical, biological and chemical observation in the environment. Science is therefore taught in secondary schools so as to strengthen the student's background in this regard. The student will at this stage begin to learn and understand the concept of what it means to observe, identify, and also classify things. Instructional materials play very important role in effective teaching and learning process of Basic Science which is a core subject taught in school especially at the junior secondary school level. Appropriate materials and instructional aids which are used by teachers to illustrate, emphasize, explain and portray knowledge, skills, values and attitude do much more than the chalk and talk practice. The teacher needs to accompany teaching with instructional materials to improve the level of understanding and academic performance of the students.

The teaching and learning of Science in Nigerian schools' dates back to the introduction of western education to Nigeria. At its early stage, Science was taught as General Science to classes 1 and 2 in the secondary schools and as Biology, Chemistry and Physics to upper classes of three, four and five. This General Science continued until 1970 when Integrated Science, was introduced as a base to express the fundamental unity of scientific thought. 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 (Omiko, 2016).

Currently, Basic Science is one of the ten subjects outlined by the Nigerian Educational Research and Development Council (NERDC) for Junior Secondary schools in Nigeria. The subject is taught at the lower secondary level and it involves the study of elementary biology, anatomy, earth/solar system, ecology, genetics, chemistry and physics as a single science subject. It offers the basic training in scientific skills required for human survival, sustainable development and societal transformation.

Science subjects are largely experimental; therefore, the teaching and learning of all science subjects require some special inputs and conditions. These inputs and conditions are generally required to enhance the learning process since science subjects have much practical components. Instructional materials are one of such requisite elements required for effective teaching and learning of the Science subjects. This is equally applicable to the teaching of Basic Science subject at the Junior Secondary Schools. Instructional materials such as glass jars, measuring cylinder, ball bearing barometer, hand lens and holders, prism, pulley, resistor, flex/insulated copper wires, models, thermometer, switches, tripod stand, Bunsen burner, spring balance, bean balance, test-tube, rubber tubing, glass tubing, gauze, wooden blocks, magnets, specimen, chemicals, spirits, balloon, aquarium, skeleton/bones, diagrams, charts, graphs, posters and audio visuals among others provide the physical media through which the intents of Basic Science curriculum can be thoroughly experienced by the students. (Nwafor & Eze, 2014 & Oka, 2015)

According to Omiko (2016), these instructional materials are determined from the objectives of teaching and learning, hence they are expected to be adequately provided and effectively used in teaching the subject. Giving the dwindling standard and quality of teaching and learning in public schools in Nigeria, and the consequent poor performances in science subjects by students in external examinations, the importance of instructional materials to teaching and learning of science subjects across all levels of educational system cannot be overemphasized. As a developing nation, Nigeria requires quality outputs from its educational system, particularly in the field of science to enhance its developmental policies and programmes.

The importance of using instructional materials in the teaching and learning of Basic Science subject has been largely researched and discussed from different perspectives. However, irrespective of the perspective, the fundamental is obvious: there is a need for continuous improvement

in teaching and learning of Science subjects in Nigerian schools both public and private. The urge to embark on this study was driven by some observations of Basic Science teaching sessions in some public junior secondary schools. The full objectives of Basic Science subject cannot be achieved if the teaching and learning process is limited to 'chalk and talk' exercises only. The 'chalk and talk' system entails writing subject notes on the board followed by verbal explanations. With the increasing population of students at the junior secondary schools, the 'chalk and talk' approach will only produce high number of ill prepared science students that may find it difficult to cope at the higher levels of learning. There is a need to make Basic Science subject teaching-leaning more effective, quicker and enjoyable, this is where effective use of instructional materials become sacrosanct.

The importance of excellent foundational knowledge in any field of study cannot be overemphasized. The JSS1 class is the first practical exposure of students to Science subjects after the elementary introduction at the primary level. At JSS1, students begin to form tangible impression about Science and their understanding of the subject begins to broaden. Consequently, students that want to build careers in science fields are expected to have comprehensive grasp of Basic Science as the first major step towards the realization of their future academic and career aspirations.

The Problem of the Study

Teaching and Learning are complementary process, and the effectiveness of both is very critical to the education system. Learners may find it difficult to comprehend what they have been taught on their own when they are not taught using the appropriate instructional materials. This could cause a major setback in the assimilation or proper understanding for the learners. Problems abound in our modern day society and environment that are difficult to find solutions to as a result of the quality of education learners are exposed to. In situations where learners are not given the enabling environment to explore and be creative in their learning process, they are automatically denied the opportunity to actively construct their own knowledge, and consequently, may find it difficult to acquire the requisite foundational knowledge in the subject.

The practice of limiting the teaching and learning of Basic Science subject to mere 'chalk and talk' process without the use of appropriate instructional materials by Basic Science teachers is not befitting any modern teaching and learning process. Teachers prefer and find it comfortable to quickly discuss the subject matter in the classrooms instead of taking the students to the

laboratory where what is being taught can be easily practicalised and concretized. On some occasions when the students are taken to the laboratory, some instructional materials are neither available nor adequate for teachers to effectively teach the subject matter, thereby subjecting teachers to an abstract method of teaching.

The researcher having observed that the teaching and learning of Basic Science subject in a Public Junior Secondary schools in the Federal Capital Territory may be creating gaps in the availability and adequacy of Basic Science instructional materials in teaching and learning Basic Science subject, decided to undertake this research work in selected Public Junior secondary schools in the Federal Capital Territory to ascertain this assumption. The problem of this study therefore, is to find out how adequately available instructional materials are in this schools.

Objectives of the Study

This study sought to assess the availability and adequacy of Basic Science instructional materials in Government Junior Secondary Schools in the Federal Capital Territory, Abuja. The study sought to achieve the following objectives:

1. To find out the Basic Science instructional materials available for teaching and learning of Basic Science subject in Government Junior Secondary Schools in the Federal Capital Territory, Abuja;
2. To ascertain the level of adequacy of the available instructional materials in teaching and learning Basic Science subjects in Government Junior Secondary Schools in the Federal Capital Territory, Abuja;

Research Questions

The following research questions guided the study:

1. What are the instructional materials available for teaching and learning Basic Science subject in Junior Secondary schools in the Federal Capital Territory?
2. How adequate are the instructional materials available for teaching and learning Basic Science in Junior Secondary schools in the Federal Capital Territory?

Hypotheses

The following hypothesis is postulated to guided the study and was tested at 0.05 level of significance.

H01: There is no significant difference in the mean response of teachers and students on the availability of instructional materials for teaching

and learning Basic Science subject in Junior Secondary Schools in the Federal Capital Territory, Abuja

Reviewed Literature

Formal Education was introduced into Nigeria, by the white Missionaries in 1842 (Omiko, 2016). At this period, the curriculum emphasized the four Rs: Reading, Riting and Rithmetic and Religion. Survey studies carried out by Abdullahi (1982) and Ukpabi (1985) showed that teaching and learning of science in Nigerian schools started as far back as 1878. Science was then 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 (2016), 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-year secondary school system into 6-3-3-4 system. That is 6 years' primary education, 3-year junior secondary school (JSS) education, 3-year Senior Secondary School (SSS) Education and 4-year 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 again 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.

According to the Federal Government of Nigeria in the National Policy on Education (FGN, 2014: 18) the aims of Basic Science teaching should be directed at enabling student to acquire the following skills: observe carefully and thoroughly; report completely and accurately what is observed; organize information acquired; generalize on the basis of the acquired information; predict as a result of the generalization; design experiments (including control where necessary) to check predictions; use models to explain phenomena where appropriate; and continue 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, using instructional materials, open-ended questions, field trips, and laboratory

methods among others. This information gives a clear outlook of what this study should take into cognizance in the course of the field work, data collection, analysis and recommendations.

Among students, science subjects have the reputation of being difficult. It is often referred to as "the dismal science", the subjects are difficult for some students who do not have independent interest in them. Because of this, it has become necessary to employ innovative techniques when teaching the subject to young people. Fortunately, educators can use tools like case studies, experiments, media, interactive learning, service learning and real world application to teach science subjects in innovative ways (Andrew & Michael, 2014).

According to Akoja and Ali (2014), instructional materials are those materials which promote the effectiveness of instructions and help teachers to communicate to the pupils. Instructional materials are those materials used in any teaching exercise to promote greater understanding of learning experiences. They are indeed used to provide the richest possible learning environment which help learners to achieve specific educational objectives. Instructional materials can also be described as those teaching aids and devises that have been systematically designed, produced and evaluated which an instructor uses to illustrate the point he wishes to emphasize in his teaching with intentions of facilitating learning.

Instructional materials serve to open up more channels for communication and create a variety of sensory impression. While using instructional materials, the teacher does not only help, but also enhances the process of perception and consequently improve the effectiveness of learning and enhances the students' academic performance. Instructional materials are those materials which aid the teacher to pass or communicate information to his learners. Hence a classroom with a wealth of instructional materials appropriate to the ability level of the students can promote effective instruction and promote conducive learning environment (Akoja& Ali, 2014).

Research Method

This study adopted a descriptive survey research design. The population for this study comprises Teachers and Students. The teachers are specifically the Basic Science subject teachers in Government Junior Secondary schools in the Federal Capital Territory, Abuja. On the other hand, the student population was constituted by both male and female students in the Junior Secondary School One (JSS1).

A sample of 30 Basic Science teachers and 75 JS students were selected as the sample for

the study from 15 schools using simple random sampling. This study adopts a random sampling method for all the samples selected for the survey. This study adopted the use of questionnaires I and II and an observation guide in collecting data from the field. Data collected were analysed using Percentages to answer the research questions. Lastly, t-test was used to test the hypothesis at 0.05 level of significance. Questionnaire I was designed to collect data from the Basic Science teachers while Questionnaire II was designed to collect information from the student respondents. The observation guide was used by the researcher to record the researcher's observations on adequacy of Basic Science instructional materials in the schools which addressed research question 2. The observation guide enabled the researcher to record firsthand data and helped to prevent distortion of facts.

Data Presentation and Analysis

Analysis of Research Question one: What are the Percentage Response of Teachers and Students on the Availability of Basic Science Instructional Materials in Government Junior Secondary Schools in the Federal Capital Territory, Abuja.

Table 1: Percentage Response of Teachers and Students on the Availability of Basic Science Instructional Materials in Government Junior Secondary Schools in the Federal Capital Territory, Abuja

Instructional Materials	Percentage Available
Learning about Environment	
▪ **Samples of matter**	66%
▪ **Living and nonliving things**	
▪ **Life specimen of plants and animals**	
▪ **Old news paper**	
▪ **Charts**	
▪ **Plastic containers**	
Community Health	
▪ **Toiletries**	40%
▪ **Cleaning agents**	
▪ **Sanitation equipment's (rakes, shovels, brooms)**	
▪ **Raw food stuff samples**	
▪ **Photographs of a drug addict**	
Physical Fitness and body Conditioning	
▪ **Video clips**	50%
Athletics (Track and Field Event)	0%
▪ **Short put**	
▪ **Discuss**	
Sports and Games	
▪ **Volley ball and soccer**	50%

Understanding Technology	0%
▪ **Woods**	
▪ **Metals**	
▪ **Ceramics**	
Basic Computer Operations and Concepts	
▪ **Computer**	67%
▪ **Computer laboratory**	
▪ **Computer soft wares**	
Sanitation Equipment	
▪ **Rakes**	25%
▪ **Shovels**	
▪ **Brooms**	
▪ **Waste Bins**	
Environmental Pollution	
▪ **Buckets**	51%
▪ **Burner**	
▪ **Pot**	
▪ **Filter paper**	
▪ **Sieve**	
▪ **Soil**	
▪ **Water**	
Pathogens Diseases and their Prevention	
▪ **Posters**	99%
▪ **Picture charts**	
Energy	
▪ **Samples of coal**	10%
▪ **Crude oil**	
▪ **Gas**	
▪ **Chart of sun**	
▪ **Battery**	
▪ **Torch light**	
Workshop Safety	
▪ **First aid box and materials**	10%
▪ **Caution triangle**	
▪ **Fire extinguisher**	
▪ **Safety kits**	
▪ **Over all**	
▪ **Hand gloves**	
Contact and Non-Contact Sport	
▪ **Video clips**	50%
Force	10%
▪ **Spring**	
▪ **Rubber**	
▪ **Objects of known mass**	
▪ **Mater rule**	
▪ **Newton meter**	
▪ **Knife edge**	
▪ **Sorted weight**	
▪ **Toy cars**	
▪ **Card boards**	
▪ **Paper**	
Material Processing	
▪ **Measuring tool**	10%

- **Driving tools**
- **Cutting tools**
- **Model of shaped blocks**
- **Greece**
- **Engine oil**
- **Louver frame**
- **Cotton**
- **Rag**
- **Brush**

Application of Information Technology in Everyday Life

- **Charts** 50%
- **Video clips**

Building Materials

- **Common building materials** 30%

Drawing Instruments

- **H.B pencil** 80%
- **Drawing board**
- **Drawing sheet**
- **Sharpener**
- **Board and tee square**

Science Development

- **Films and picture clips on space travel** 10%
- **Globe**
- **Satellite**
- **Plastics and metal containers**

Tools, Machines and Processes

- **Work shop hand tools** 0%
- **Measuring tools**
- **Setting marking out tools**
- **Driving tools**
- **Burning tools**
- **Holding tools**
- **Cutting and pairing tools**
- **Care and maintenance tools**

Metal Work and Tools

- **Steel rule** 0%
- **Hammer**
- **Mallet**
- **G clamp**
- **Sash clamp**
- **Screw drivers**
- **Brace**
- **Saw**

Information Transmission

- **Charts** 99%
- **Pictures of tools for transmitting information**

Data Processing 16%

- **Computer**
- **Appropriate soft ware**
- **Videos**
- **Television**
- **Multimedia computer**
- **Multimedia presentations**

Recreational, Leisure and Dance Activities ▪ **Video clips**	50%
Food and Nutrition ▪ **Various type foods** ▪ **Charts and pictures**	50%

Table 1 shows the percentages in which Basic Science instructional materials are available in Government Junior Secondary schools in the Federal Capital Territory. The percentages were calculated by dividing the available instructional materials by expected instructional materials and then multiplied by 100. From the data presented, it is observed that instructional materials for topics such as Information Transmission (Charts; Pictures of tools for transmitting information) and Pathogens Diseases and their Prevention (Posters and Picture charts) are highly available as indicated by 99% of the respondents.

However, topics (and instructional materials) such as Drawing Instruments (Drawing board; Drawing sheet; Sharpener; Board and Tee Square); Basic Computer Operations and Concepts (Computer; Computer laboratory; Computer software); Application of Information Technology in Every Day Life (Charts; Video clips); Learning about the Environment (Samples of matter; Living and nonliving things; Life specimen of plants and animals; Old newspapers; Charts; Plastic containers); Environmental Pollution (Buckets; Burner; Pot; Filter paper; Sieve; Soil; Water); Physical Fitness and Body Conditioning (Video clips; Teacher's demonstration of some exercises); Sports and Games (Volley ball and soccer; Soccer ball); Contact and Non-Contact Sport (Video clips; Demonstration); Recreational, Leisure and Dance Activities (Video clips; Demonstration); and Food and Nutrition (Various type foods; Charts and pictures) have between 50-80 percent availability.

On the other hand, the availability level of instructional materials in topics like Community Health (Toiletries; Cleaning agents; rakes, shovels, brooms; Raw food stuff samples; Photographs of a drug addict); Building Materials (Cements; Bricks;

Sands); Sanitation Equipment (Rakes; Shovels; Brooms; Waste Bins); Data Processing (Computer; Appropriate software; Videos; Television; Multimedia computer; Multimedia presentations); Energy (Samples of coal ;Crude oil ;Gas ;Chart of sun; Battery; Torch light); Work Shop Safety (First aid box and materials; Caution triangle; Fire extinguisher; Safety kits; Over-all wears; Hand gloves); Force (Spring; Rubber; Objects of known mass; Mater rule; Newton meter; Knife edge; Sorted weight; Toy cars; Card boards; Paper); Material Processing (Measuring tool; Driving tools; Cutting tools; Model of shaped blocks; Greece; Engine oil; Louver frame ;Cotton; Rag; Brush); Science Development (Films and picture clips on space travel; Globe; Satellite; Plastics and metal containers) are below 50 percent.

Lastly, the data shows that there is zero percent availability of Basic Science instructional materials in topics like Athletics (Track and Field -Short-put and Discuss); Understanding Technology (Woods; Metals; Ceramics); Tools, Machines and Processes (Work shop hand tools; Measuring tools; Setting marking out tools; Driving tools; Burning tools; Holding tools; Care and maintenance tools); Metal Work and Tools (Steel rule; Hammer; Mallet; G-clamp; Sash clamp; Screw drivers; Brace; Saw) as indicated by the respondents.

The overall analysis of responses on the availability of Basic Science instructional materials shows that only 39% of the respondents confirmed the availability of the expected instructional materials for the teaching and learning of the subject in Government Junior Secondary schools in the Federal Capital Territory, Abuja.

Research Question 2: How adequate are the instructional materials available for teaching and learning Basic Science in Government Junior Secondary Schools in the Federal Capital Territory?

Table 2: Percentage Response of Teachers and Students on the Adequacy of Instructional Materials for Teaching and Learning Basic Science

Response	Adequate	Inadequate
Teachers	5 (16.7%)	25 (83.3%)
Students	0 (0%)	150 (100%)

Table 2 shows the percentage scores of the responses of teachers and students on the adequacy of basic science instructional materials used in teaching and learning in Government Junior Secondary Schools in the Federal Capital Territory. From the above analysis it is observed that 5 teachers representing 16.7% of the population of teachers responded to an average adequacy of basic science instructional materials used in teaching and learning in the schools, while 25 teachers representing 83.35% responded to a poor adequacy of basic science instructional materials used in teaching and learning in the schools. 150 students representing the total population of the group responded to 100% poor adequacy of Basic Science instructional materials used in teaching and learning in the schools. This corroborates the researcher's observation on the adequacy of Basic Science instructional materials in the schools. The data from the observation guide indicated poor adequacy of the instructional materials as the ratio of students to instructional materials is low at an average ratio of 12:1.

Testing of Hypothesis

$H_{01:}$ There is no significant difference in the mean response of teachers and students on the availability of instructional materials for teaching and learning basic science subject in Government Junior Secondary schools in The Federal Capital Territory. The hypotheses H_{01} is meant to compare the mean responses of both groups (Teachers and Students) on the availability of basic science instructional materials in teaching and learning on the schools.

Table 3: Chi Square responses on the 'availability of Basic Science instructional materials in Government Junior Secondary schools in Federal Capita Territory, Abuja

	Value	df	Asymptotic Significance (2-sided)	Exact Sig. (2-sided)	Exact Sig. (1-sided)
Pearson Chi-Square	25.010[a]	1	.000		
Continuity Correction[b]	22.852	1	.000		
Likelihood Ratio	22.723	1	.000		
Fisher's Exact Test				.000	.000
Linear-by-Linear Association	24.871	1	.000		
N of Valid Cases	180				

a. 0 cells (0.0%) have expected count less than 5. The minimum expected count it 0.87.
b. Computed only for a 2×2 table

Table 3 shows the summary of the independent t-test result on teachers and students' response on availability of Basic Science instructional materials. The result revealed that the noted difference in the mean response of teachers and students is significant. Since the associated probability of 0.000 is less than 0.05 the null hypothesis was therefore rejected implying that there is significant difference in the mean response of teachers and students on the availability of Basic Science instructional materials in Government Junior Secondary Schools in Federal Capital Territory, Abuja. In this case the teachers responded to the availability of more instructional materials while the students responded to the availability of fewer instructional materials. This therefore resulted to the significant difference in the mean response of teachers and students on the availability of basic science instructional materials

Conclusion

The findings of this study are very revealing and have informed the following conclusions. Despite the confirmation by the officials of the FCT UBEB that the UBEC headquarters do facilitate the supply of instructional materials in every subjects especially science related subjects to all Government Junior Secondary schools in every state in the country including the Federal Capital Territory, the Government Junior Secondary schools in the FCT do not have the following Basic Science instructional materials :Woods; Metals; Ceramics; Work shop hand tools; Measuring tools; Setting marking out tools; Driving tools; Burning tools; Holding tools; Care and maintenance tools; Steel rule; Hammer; Mallet; G-clamp; Sash clamp; Screw drivers; Brace; Saw; Short-put and Discuss required to teach Basic Science topics such as Understanding Technology; Tools, Machines

and Processes; Metal Work and Tools; and Athletics -Track and Field respectively. However, other types of ERC recommended Basic Science instructional materials are available in low quantities.

Recommendations

Based on the findings of this study, the following recommendations are made:

1. Basic Science instructional materials should be made available to all Government Junior Secondary schools in the FCT. The instructional materials should be provided to schools according to their projected students' enrolment into the schools. Teaching and learning environment is as important as any other factor in the learning process.

2. The FCT UBEB should ensure classrooms and Basic Science laboratories are adequate, well equipped and conducive.

3. Teachers should be trained to improvise instructional materials where and when possible rather than completely abandon a topic simply because the instructional materials are not available.

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