ASSESSMENT OF OUTDOOR LEARNING ACTIVITIES IN THE TEACHING OF BASIC SCIENCE AND TECHNOLOGY IN JUNIOR SECONDARY SCHOOLS IN EKITI STATE, NIGERIA

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Abstract

The study identified the outdoor learning activities in Basic Science and Technology (BST) curriculum. The study assessed the extent of the use of outdoor science learning activities in teaching BST in the junior secondary schools in the study area. It further examined the perceived influence of teachers' use of outdoor learning activities on students' learning in the study area. This was with a view to providing information on the outdoor science learning activities in BST Curriculum that could enhance learning outcomes. The study adopted descriptive survey research design. The population for the study comprised all Basic Science in public and private junior Secondary Schools in Ekiti State, Nigeria. A purposive sampling technique was used to draw a representative sample of 160 BST teachers. The representative sample size was drawn from four local government areas selected from each of the three senatorial districts in Ekiti State using simple random sampling technique. Seven junior secondary schools from each LGA and two teachers from each school were selected using purposive sampling technique based on the condition that the teachers have been teaching Basic Science and Technology(BST) for more than five years. Data were collected using appropriate questionnaires. The validity of the instruments was ensured through experts' judgement. The results of the study showed that identified outdoor science learning activities in BST could enhance learning. The study concluded that some of the topics in BST curriculum are often taught with outdoor learning activities while some topics are less often taught on the average. Recommendations that would facilitate the teaching of outdoor learning activities in BST in junior secondary schools such as organising of regular conferences, seminars and workshop for teachers to arouse their awareness on outdoor learning activities in the curriculum were made.

Keywords: Assessment, outdoor learning activities, teaching, Basic Science and Technology, junior secondary schools.

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Introduction

Nigeria recognises the need to step up with the trends of scientific and technological development came up with the Universal Basic Education (UBE) programme in September 1999 to provide functional and effective education (Yusuf & Ajere, 2009). Basic Science and Technology (BST) is one of the approved subjects for Universal Basic Education (UBE) and the only science based subject in the curriculum at both Basic Primary and Junior Secondary School Schools (JSS) in Nigeria, its contents prepare students for the acquisition of rudimental knowledge in pursuing of science subjects at higher levels of education. That is, the knowledge acquired in BST has a long way to preparing students for science and technology disciplines in later years at the senior secondary schools and in tertiary institutions. The curriculum for Basic Science and Technology in Junior Secondary School (JSS) has subdivision of themes of Basic Science, Physical and Health Education, Basic Technology and Information

Technology (IT). Each of the contents in the subdivision has leading role to enhance the actualization and empowerment of Science and Technology in Nigeria. The organisation of contents in BST curriculum creates effective means at reaching different categories of students with the broad range of skills and experiences.

The overall objectives of the new Basic Science and Technology curriculum as outlined in Nigerian Educational Research and Development Council (NERDC, 2012) are to enable the learners to:

1. acquire basic knowledge and skills in science and technology;
2. be safety and security conscious;
3. apply scientific and technological knowledge and skills to meet contemporary societal needs;
4. avoid drug abuse and related vices;
5. become prepared for further studies in science and technology; and
6. develop an interest in science and technology and take advantage of numerous career opportunities provided by science and technology.

The comprehensive objectives of BST cannot be realistic without the understanding of practicing science. Researchers have shown that practice and the doing of science are not practically experienced by students in many schools due to deterioration or lack of laboratory facilities and lack of adequate instructional materials which have led to daunting attitude of students to entity of science at junior secondary level. Olajide, Adebisi and Tewogbade, (2017) reveal that laboratory resources are not available in schools to teach students Basic Science in BST at junior secondary schools and most teachers do not make use of the few available laboratory facilities in their classrooms. Although, materials are not available in most of the schools yet science teachers are rigid to classroom settings alone without improvisation or outdoor science teachings. To arouse the young mind towards science there is a need for them to have contact with basic experimental procedures around them in form of outdoor learning activities.

The term outdoor activities in education became known in 1940s to describe the instructional use of natural environments to meet up with students learning activities. Education in the outdoors referred to the use of the outdoors environments as a learning source and setting for formal educational process (Mazuki, Azlizam, Md Amin. & Jaffry 2014). Also, Conway (2010) defined outdoor education as a method of teaching and learning process involving exploration and discovery using the first-hand experience in the environment. Outdoors learning is not exclusively limiting teachers to the four wall of a classroom; such learning coupled different learning strategies such as discovery, play-way method, corporative, field trips and excursions to explore the environment scientifically. Therefore, outdoor education is an activity based or action oriented in social context. Outdoor education activities involve learning outside the classroom or laboratory setting using natural or improvised materials to actualise the objectives of teaching and learning through direct experience.

Outdoor learning activities stamp out rote learning, memorization and abstractions in science. When science lessons are not presented in relax interactive forum students may have distorted ideas on the concept learnt. As observed by Ogunsanwo (2004)

learners play with water, mud, insects and whatever they can touch, smell, or hear as they play with these things, a lot of scientific skills such as observing and making inferences are learnt. That is, there is ample space for exploration and discovery for learners at all ages to collaborate gainfully in relax atmosphere. Experience of such can come into use during outdoor interactions.

Review of Literature

Outdoor learning is the type of education in which the learner is actively engaged in having experience in constructing the knowledge from resources or materials outside the normal school classroom setting mostly under instructional guide of a teacher or an educator. According to Ericksson-Dobrovich (2005) out learning activity is a method of learning with the use of all senses that takes place out-of-classroom doors in a natural environment or other out-to-door learning spaces. Similarly, Priest (1986) defines outdoor learning as an experiential process of learning by doing, which takes place primarily through exposure in the out-of-doors. Learning experiences need not be restricted to the classroom alone because environment provides a myriad of initiative phenomena to aid the process of learning especially in sciences. Also, there is some science concepts that can be better taught through the outdoor activities. According to Charlesworth and Lind (1999) learners apply science concepts when they explore the outdoors learning activities. Further research findings such as in the work of Chioma and Kelechi, (2016) found out that learning based on the environment and the outdoors has shown to improve students' academic achievement and standardized test scores. Ernst and Monroe (2004) discovered that such learning improve critical thinking skills. Therefore, outdoor education has enduring approach to establish fact findings phenomenon in science. Hammerman, Hammerman Hammerman (1994) explained that most of science concepts learned in school at the verbal level are mere words without meaning and such cannot replace first-hand observations and experiences through outdoor activities.

Statement of the problem

Studies conducted in many countries have shown the beneficiary impact of outdoor learning activities. Although, different studies have been conducted in Nigeria on different issues as related to teachers and students' factors on BST yet the outcomes have not made significant contributory impact for more students to continue to embrace activities of science. However, the examinable view of the BST curriculum reveals that teachers can gainfully use outdoor learning activities to pursue the stated objectives but there is few literature or studies on the use of outdoor learning activities, hence there is a need to survey into outdoor science learning activities in the teaching of Basic Science and Technology in junior secondary schools in the study area.

Purpose of the study

The purpose of this study is to assess the outdoor learning activities in the teaching of Basic Science and Technology in Ekiti state, Nigeria.

Research Questions

The following research questions guided the study:

1. what are the identified outdoor science learning activities in Basic Science and Technology curriculum in junior secondary school in Ekiti State, Nigeria?
2. to what extent do teachers use identified science outdoor learning activities in teaching Basic Science and Technology in junior secondary school in Ekiti State, Nigeria?
3. do perceived teachers' uses of outdoor science learning activities influence students learning of Basic Science and Technology in the study area?

Scope of the Study

The study was restricted to junior secondary schools in Ekiti State. Eighty four (84) public and private schools were selected from the three senatorial districts in the state through purposive sampling technique.

Methodology

Research Design

The descriptive survey research design was used for the study. The design was chosen because the researchers collected the data through the use of questionnaires.

Population of the study

The population of the study comprised all Basic Science and Technology teachers in private and public junior secondary schools in Ekiti State.

Sample and Sampling Technique

The sample consisted of targeted 160 Basic Science and Technology teachers from the three senatorial district of Ekiti State. Four Local Government Areas (LGAs) were selected from each of the three senatorial districts in Ekiti State using simple random sampling techniques. Seven schools were selected from each of the LGAs using purposive sampling techniques made up of 48 public schools and 36 private schools. Two Basic Science teachers were purposively used for the study based on their years of experience of teaching the subject for more than five years and their availability for the study.

Research Instruments

Two research instruments used for data collection are:

Identification of Outdoor Learning Activities (IOLA)

The instrument consists of 16 topics identified by the researchers as against teachers' activities in BST curriculum that could be taught through outdoor science educational activities.

Teachers Outdoor Activities Questionnaire (TOAQ)

The Teachers Outdoor Activities Questionnaire (TOAQ) consists of three sections. Section A provided information on the respondents' demographic information while the section B consists of 16 identified topics in IOEA. This section assessed teachers' use of outdoor learning activities to teach identified topics in the curriculum. The modes of responses are Not at All, Less Often, Often, and Very Often. Section C of the instrument answers the research question on the perception of teachers on the influence of outdoor learning activities on learning of BST. This section consists of 14 structured items on perceived influence of teachers' use of the learning activities on students learning, the teachers mode of responses were subjected to categorical scale.

Validity of the Instruments

The research instruments used were given to three experts in the Department of Science and Technology Education, one expert from Institute of Education all at Obafemi Awolowo University, Ile-Ife and two BST teachers in Junior Secondary school in the state of the study to ascertain the face and content validity. Necessary modifications and adjustments of the questionnaires were ensured by the experts to the constructed items.

Procedure for Data Collection

The researchers personally visited the schools used for the study, sought permission from the school authorities to carry out the study in their schools. After that, the interests of BST teachers were sought by the researchers and Questionnaires were administered to the teachers and were retrieved - immediately they were completed. Eight respondents failed to complete the questionnaires provided so they were excluded from the overall in the analysis.

Analysis of Results

Research Question One

What are the identified outdoor science learning activities in Basic Science and Technology curriculum in junior secondary school in Ekiti State, Nigeria?

Table 1: Outdoor science activities identified in BST curriculum in Junior Secondary School

S/N	TOPICS	OUTDOOR ACTIVITIES
1	Environmental pollution	Organise visit to a site of polluted water, a nearby industry or place polluted by a spoilt egg/tomatoes and polluted soil
2	Living and Non-living things	Students are to go on nature walk and collect different sample of matter. Guides student to prepare plants and insects albums
3	Energy	Materials are to be provided to illustrate forms of energy outside the classroom
4	Forces	Students are to engage in push and pull, squeeze, bend, and stretch Objects within the school environment
5	Gravitational force	Demonstration of the effect of gravitation on objects outside the classroom
6	Living things	Identification of living organism in different habitats.
7	Chemicals	A visit to a nearby chemical factory to demonstrate how Some of the safety equipment work
8	Work, Energy, and Power	Students should be guided to illustrate concept of work; the relationship between work, energy, and power outside the classroom
9	Change of State	Students are to be guided to carry out activity on boiling and evaporation; discussion of findings from visited nearby stream to the school
10	Crude oil and Petrochemicals	A visit to fuel station to see different petroleum products
11	Environmental Hazard I	A visit to nearby erosion site and guide the students to suggest measures of control on observed different drainage patterns around the community
12	Environmental Hazard II	The students should be made to participate in tree planting exercise organized by the teacher within the school environment
13	Environmental Hazard III	A visit to community to see the effort of people to curb Desertification
14	Drug and substance abuse	The teachers are to arrange experts to discuss drug abuse, its effects and prevention
15	Resources from living things	Execution of field trip
16	Skills Acquisition	The teachers are to lead the students to different artisan like fine artists, mechanics, tailors etc.

Table 1 shows some of the topics that could be taught using outdoor science activities in BST Curriculum in Junior Secondary School.

Research Question Two

To what extent do teachers use identified science outdoor learning activities in teaching Basic Science and Technology in junior secondary school in Ekiti State, Nigeria?

The answer to this research question is presented in Table T1

Table 2: Extent of Teachers Use of Outdoor Science Educational Activities

S/N	Topics	Not at all Frequency (%)	Less often Frequency (%)	Often Frequency (%)	Very Often Frequency (%)	Mean	Reward
1.	Environmental Pollution	7(4.4)	21(13.1)	78(48.8)	54(33.8)	3.12	Often
2.	Living and Non-living things	2(1.3)	14(8.8)	73(45.6)	71(44.4)	3.33	Often
3.	Energy	2(1.3)	53(33.1)	81(50.6)	24(15.0)	2.79	Often
4.	Forces	7(4.4)	48(30.0)	82(51.3)	23(14.4)	2.76	Often
5.	Gravitational Forces	27(16.9)	63(39.4)	49(30.6)	21(13.1)	2.40	Less Often
6.	Living things	3(1.9)	31(19.4)	57(35.6)	69(43.1)	3.20	Often
7.	Chemicals	45(28.1)	54(33.8)	44(27.5)	17(10.6)	2.21	Less Often
8.	Work, Energy and Power	1(0.6)	70(43.8)	62(38.8)	27(16.9)	2.72	Often
9.	Types of Energy	15(9.4)	67(41.7)	54(32.8)	24(15.0)	2.54	Often
10.	Crude oil and Petrochemical	65(40.6)	43(26.9)	34(21.3)	18(11.3)	2.03	Less Often
11.	Environmental Hazards	10(6.3)	32(20.0)	67(41.9)	51(31.9)	2.99	Often
12.	Environmental Hazards II	48(30.0)	49(30.6)	47(29.4)	16(10.0)	2.18	Less Often
13.	Environmental Hazards III	34(21.3)	40(25.0)	61(38.1)	25(14.7)	2.46	Often
14.	Drugs and Substances abuse	37(23.1)	57(35.6)	42(26.3)	24(15.1)	2.31	Less Often
15.	Resources from Living things	87(54.4)	24(15.0)	22(13.8)	27(16.9)	1.91	Less Often
16.	Skill acquisitions	29(18.1)	53(33.1)	58(36.3)	20(12.6)	2.41	Less Often

Table 2 provides information on the extent of teachers' use of outdoor science educational activities in teaching BST. Items 1, 2, 3, 4, 6, 8, 9, 11, and 13 with mean values of 3.12, 3.33, 2.79, 2.76, 3.20, 2.72, 2.54, 2.99 and 2.46 are often taught with outdoor science learning activities, while items 5, 7, 10, 12, 14, 15 and 16 with mean values of 2.40, 2.21, 2.03, 2.18, 2.31, 1.91, and 2.41 are less often taught by outdoor science learning activities.

Research Question Three

Do perceived teachers' uses of outdoor science learning activities influence students learning of Basic Science and Technology in the study area?
The answer to this research question is presented in table four:

Table 3: Teachers' perception on the influence of outdoor science activities on students' learning

S/N	Teachers' Perception	YES Frequency (%)	NO Frequency (%)	Mean	Decision
1.	Positive Impact	159(94.9)	1(0.6)	0.99	Yes
2.	Students Performance	157(98.1)	3(1.9)	0.98	Yes
3.	Classroom teaching	160(10.0)	0(0.0)	1.00	Yes
4.	Science Process Skills	157(98.1)	3(1.9)	0.98	Yes
5.	Communication and understanding	154(96.3)	6(3.8)	0.96	Yes
6.	Understanding basic Concepts	151(94.4)	9(5.6)	0.94	Yes
7.	Students' processing skills	18(11.3)	142(88.9)	0.11	No
8.	Students attitude	150(93.8)	10(6.3)	0.94	Yes
9.	Curiosity in learning Science	156(97.5)	4(2.50)	0.98	Yes
10.	Participation and	152(95.0)	8(5.0)	0.95	Yes
11.	Cannot promote Social interaction	43(26.9)	117(73.1)	0.23	No
12.	Practical teaching	123(16.9)	37(23.1)	0.77	Yes
13.	Motivate learners.	153(95.6)	7(4.4)	0.96	Yes
14.	Students' retention.	157(98.1)	3(1.9)	0.98	Yes

Table 3 shows the perception of teachers on the influence of outdoor science activities on students' learning in BST. There is an agreement of opinion to all the items that the uses of outdoor science learning activities can influence learning except item 7 and 11. The outdoor science learning activity is agreed to influence the performance, science process skills, understanding of basic concept, processing skills, attitude of student. This implies that outdoor science learning activities can influence the cognitive, psychomotor and attitude of students in BST.

Discussion

The first research question was to identify outdoor learning activities in the BST curriculum in which the teachers can use in teaching topics in Basic Science and Technology. It was evident that the activities for each of the selected topics were accorded with relevant outdoor learning activities for the students. The implication of this is that teachers can adapt appropriate outdoor activities in teaching each topic and this will make learners learn better. According to Dietz (2000) when teachers and educators teach science concepts indoors that are best taught outdoors, the concept is isolated from its natural setting, thereby limiting the full use and potential of a child's brain and this may lead to de-contextualization or de-funtionalization of the concept.

The second research question examined the extent to which teachers use outdoor learning activities in teaching Basic Science and Technology in junior secondary school in the study area. The study pointed out that outdoor learning activities are often and less often used to teach some topics. This was contrary to the study of Odili, Edisine and Ajuar, (2010) on teachers' involvement in implementing the Basic Science curriculum of the 9-years Basic Education in Warri South Local Government Area of Delta State of Nigeria where the results showed that teachers are not

implementing outdoor activities in the curriculum. The result of the study was also contrary to the study of Nwosu and Ibe (2012) on assessment of teachers' level of implementation of basic science curriculum where it was showed that teachers had a poor implementation of the curriculum as they were not engaging in the use of outdoor activities.

The third research question investigated the perception of teachers on the influence of outdoor science learning activities on students' learning in BST. The study showed that the teachers in the study area agreed that the use of outdoor learning activities can influence students' performance, science process skills, understanding of basic concept, processing skills, attitude in science. This was in support of the following research findings: Chioma and Kelechi (2016) found out that learning based on the environment and outdoors has shown to improve students' academic achievement and standardized test scores; Ernst and Monroe (2004) discovered that such learning improves critical thinking skills.

Conclusion

The study concluded that some of the topics in BST curriculum are often taught with outdoor learning activities while some of the topics are less often taught on the average. The study further concluded that BST teachers in the study area agreed that outdoor activities can influence students' learning of science.

Recommendations

Based on the finding of the study, it was recommended that regular conferences, seminars and workshops should be organised for the Basic Science and Technology teachers to create the awareness of outdoor science learning activities in the curriculum and acquaint them with the necessary skills for the use of outdoor science educational activities in teaching of BST. Also, the school supervisors from Ministries and Boards of Education should check for evidences or proves of teachers' uses of outdoor science learning activities in the teaching of Basic Science and Technology during school supervisions and inspections.

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