ASSESSMENT OF BASIC SCIENCE AND TECHNOLOGY CURRICULUM IMPLEMENTATION IN LOWER PRIMARY SCHOOLS IN ONDO STATE, NIGERIA

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Abstract
The study assessed the methodology used by teachers to teach Basic Science and Technology (BST) and determined the availability and adequacy of instructional resources and materials for the implementation of BST curriculum in lower primary schools in Ondo State. The study employed the descriptive survey research design. The population for the study comprised all lower primary schools Basic Science and Technology teachers in Ondo State. The sample for the study comprised of thirty-six (36) Basic Science and Technology teachers selected using simple random sampling technique. Thirty-six lower primary schools were selected for the study using multistage sampling procedure. The instruments for data collection in this study were Basic Science and Technology Curriculum Implementation Retrieval Sheet (BSTCIRS) and Basic Science and Technology Curriculum Instructional Resources Observational Checklist (BSTIROC). The instrument was validated by experts for its face and content validity. Data collected were analyzed using frequency counts, percentages and ratio. The result revealed that primary school teachers frequently adopt demonstration, discussion, play-way, pictorial-teaching, activities-based, cooperative, learning-based and hands on methods. The percentage of each were 28(77.8%), 28(77.8%), 23(63.9%), 30(83.3%), 30(83.3%), 24(66.7%), 21(58.3%), 24(66.7%) and 22(61.1%) respectively for the teaching of BST in lower primary schools in the study area.

Keywords: Assessment, Implementation, Basic Science and Technology

Introduction

Science is the knowledge about the physical and natural world based on facts which can be proven experimentally. Science has three inter related aspects which are content, articles and process. Bello (2012) posited that the knowledge of science and technology is therefore of necessity in all countries and essentially by all people in the whole world due to countless challenges that are facing them. The implementation of science in various fields of life has been responsible for raising people's standard of living. Nationwide, countries are in era of science and technology, where scientific knowledge has grown exponentially and technology has progressed at a rapid pace (Rauf, Rasul, Mansor, Othman & Lyndon, 2013). Science and technology effect can be clearly seen in all aspects of our lives and that is why it is necessary that all children need to have some levels of understanding of the scientific principles at the early life. Federal Government of Nigeria (NPE, 2014) specified that science at the elementary level should be fitted towards the development of the skills of the learners for the total development of nations.

Basic science and Technology has been seen as a tool for solving socio-economic problems and different problems affecting developing nations of the whole world. Science and its implication (Technology) brought about huge gains to almost all the developed countries (Oloyede & Bamidele, 2009) For a nation to develop, more supervision as well as attention should be directed towards the teaching of Science and Technology Education in primary and secondary school levels as this would lay the basic foundation for its development. Basic science and technology allows pupils to be taught different science courses in a whole with the intention of introducing them to scientific methods of solving problems and all that sciences involve.

Performance of students in Nigeria are low and not encouraging. Oduolowu (2004), Okoruwa (2007) and Ekine (2010) ascribed the existing pre-primary/ primary school poor performance of pupils to the use of inappropriate instructional methods, inadequate teaching facilities, personnel and instructional materials. Basic science should be taught by teachers that are well equipped and are conscious of the teaching techniques to drive home their poinst with the learners. That is, having good mastery of the subject matter is not enough but there is need for the awareness of which teaching technique is best for each topic of the subject. Basic Science and Technology should be taught in schools with adequate provision of resource materials and adequate instructional strategies. Resources are physical objects which may be natural or improvised, used in teaching Basic science and Technology in Schools (Adejumo, 2012). There is need to assess the implementation of the Basic Science and Technology programmers after almost six years of its re-introduction.

Statement of the Problem

Despite the necessity of science in contemporary development, the performance of pupils in Science is not encouraging. Scholars have investigated the reasons for this poor performance and have found inadequate supply of instructional resources, inappropriate instructional strategies, lack of qualified teachers, absence of practical work and poor delivery which are instrumental to the implementation of Basic Science and Technology (BST). In line with this, scholars have investigated the implementation of curriculum in various subjects especially in secondary schools in Nigeria. It is therefore essential to assess the implementation of BST Curriculum contents at the lower primary school level; hence this study.

Purpose of the Study

The purpose of the study is to investigate the implementation of BST in primary schools in lower primary schools in Ondo State. Therefore, the specific objectives are to;

a. assess the method used by the teachers to teach BST in lower primary school in Ondo State;
b. determine the availability and adequacy of instructional resources and materials for the implementation of BST curriculum in the lower primary schools in Ondo State.; And what?

Research Questions

The following questions were raised to guide the study:

a. What methodology do the teachers adopt to teach BST in lower primary schools in Ondo State?
b. How available and adequate are instructional resources and materials, for the implementation of BST curriculum in lower primary schools in Ondo

Methodology

The study adopted a descriptive survey research design. The population for the study comprised all lower primary school Basic Science teachers in the 18 Local Government Areas in Ondo State. The study sample was 36 Basic Science and Technology teachers. Multistage sampling procedure was used to select the sample for this study. The three senatorial districts were used. Three Local Government Areas (LGAs) were selected from each senatorial districts in the State using simple randomly sampling technique. Four schools were selected from each LGA using simple random sampling technique, making a total of thirty-six schools. One BST teacher was selected in each sampled school. The study made use of the following two instruments: Basic Science and Technology Curriculum Implementation Retrieval Sheet (BSTCIRS), and Basic Science and Technology Instructional Resources Observational Checklist (BSTIROC). The second instrument was used to assess the level of BST curriculum content being taught by the teachers in primary schools. The BSTIRC was used to check the resources available in the school.

Both research instruments were validated by giving them to the researcher's supervisor and other experts in the Department of Science and Technology Education of the Obafemi Awolowo University, for face and content validity. Some items were modified while some were removed.

To determine the reliability of the BST Retrieval Sheet and Checklist, the instruments were trial-tested on 27 respondents from schools outside the scope of the study. Data collected were analyzed using Cronbach Alpha. The reliability coefficients of BSTIROC and BSTCIRS were 0.75 and 0.78 respectively. Efforts were made to seek the consent of the school heads for approval to use their schools for research. This was done to avoid any form of disruption on the school programme. In order to gain access to the respondents, a Letter of Introduction was obtained from the Acting Director, Institute Education, Obafemi Awolowo University for presentation to the head teachers of the schools and Directors, at the Ministry of Education and public primary schools in Ondo State Ministry of Education.

Results

The data collected were analyzed according to each research question.

Research Question One: What methodology do the teachers adopt to teach BST in lower primary schools in Ondo State?

In order to answer this research question, data collected on the methods adopted by teachers in teaching BST in lower primary schools were subjected to descriptive analysis and the results are presented in Table 1.

Frequently Used = FU, Often Used = OU, Not Used = NU, Standard Deviation = SD

Table 1: Descriptive analysis of the methodology adopted by teachers in teaching BST in lower primary schools in the study area

N = 36

S/N	Methodology	FU f(%)	OU f(%)	NU f(%)	Mean	SD
1.	Lecture Method	13(36.1)	17(47.2)	6(16.7)	1.81	0.71
2.	Project Method	18(50.0)	13(36.1)	5(13.9)	1.64	0.72
3.	Demonstration Method	28(77.8)	7(19.4)	1(2.8)	1.25	0.50
4.	Discovery Method	13(36.1)	16(44.4)	7(19.4)	1.83	0.78
5.	Individualized Method	17(47.2)	9(25.0)	10(27.8)	1.81	0.86
6.	Discussion Method	28(77.8)	7(19.4)	1(2.8)	1.25	0.50
7.	Concept Mapping	17(47.2)	13(36.1)	6(16.7)	1.69	0.77
8.	Inquiry Method	18(50.0)	16(44.4)	2(5.6)	1.56	0.61
9.	Laboratory Works	12(33.3)	13(36.1)	11(30.6)	1.97	0.81
10.	Field Trip	12(33.3)	19(52.8)	5(13.9)	1.81	0.67
11.	Role Playing	16(44.4)	13(36.1)	7(19.4)	1.76	0.77
12.	Play-Way	23(63.9)	12(33.3)	1(2.8)	1.39	0.55
13.	Pictorial	30(83.3)	5(13.9)	1(2.8)	1.19	0.47
14.	Teaching Method	30(83.3)	4(11.1)	2(5.6)	1.22	0.54
15.	Peer Tutoring	15(41.7)	16(44.4)	5(13.9)	1.72	0.70
16.	Activities-based Teaching	24(66.7)	8(22.2)	4(11.1)	1.44	0.69
17.	Cooperative Method	21(58.3)	11(30.6)	4(11.1)	1.54	0.69
18.	Learning-based Method	24(66.7)	10(27.8)	2(5.6)	1.39	0.52
19.	Hands on Method	22(61.1)	9(25.0)	5(13.9)	1.53	0.74

Table 1 showed the descriptive analysis of the methods teachers adopted to teach BST in lower primary schools in Ondo State. It can be deduced from the table that primary school teachers frequently adopt demonstration method, discussion method, play-way method, pictorial method, teaching method, activities-based method, cooperative method, learning-based method and hands on method at 28(77.8%), 28(77.8%), 23(63.9%), 30(83.3%), 30(83.3%), 24(66.7%), 21(58.3%), 24(66.7%) and 22(61.1%) respectively for the teaching of BST in lower primary schools in the study area.

Research Question Two: How available and adequate are instructional resources and materials for the implementation of Basic Science and Technology curriculum in lower primary schools in Ondo State?

In order to answer this research question, data collected on the availability and adequacy of instructional resources and materials were subjected to descriptive analysis and the results are presented in Table 2

Available = A, Not Available = NA, Adequacy = A, Not Adequate = NA

Table 2: Descriptive analysis of the availability and adequacy of instructional resources and materials for the implementation of Basic Science and Technology in the study area

N = 36

S/N	Instructional Resources	Availability		Adequacy	
		A f(%)	NA f(%)	A f(%)	NA f(%)
1.	Beaker	10(27.8)	26(72.2)	10(27.8)	26(72.2)
2.	Bell Jar	5(13.9)	31(86.1)	5(13.9)	31(86.1)
3.	Bunsen Burner	5(13.9)	31(86.1)	10(27.8)	26(72.2)
4.	Boiling Tubes	17(47.2)	19(52.8)	10(27.8)	26(72.2)
5.	Conical Flask	16(44.4)	20(55.6)	16(44.4)	20(55.6)
6.	Cylinder	13(36.1)	23(63.9)	13(36.1)	23(63.9)
7.	Wall Chat	24(66.7)	12(33.3)	24(66.7)	12(33.3)
8.	Spatula	13(36.1)	23(63.9)	13(36.1)	23(63.9)
9.	Stove	19(52.8)	17(47.2)	16(44.4)	20(55.6)
10.	Laboratory	14(38.9)	22(61.1)	14(38.9)	22(61.1)
11.	Workshop Building	10(27.8)	26(72.2)	10(27.8)	26(72.2)

S/N	Instructional Resources	Availability		Adequacy	
		A f(%)	NA f(%)	A f(%)	NA f(%)
12.	Plastic Materials	20(55.6)	16(44.4)	16(44.4)	20(55.6)
13.	Glass Mirror	12(33.3)	24(66.7)	12(33.3)	24(66.7)
14.	Picture Books	24(66.7)	12(33.3)	12(33.3)	24(66.7)
15.	Computer	20(55.6)	16(44.4)	16(44.4)	20(55.6)
16.	Science Corner	9(25.0)	27(75.0)	9(25.0)	27(75.0)
17.	Fire Wood Jar	4(11.1)	32(88.9)	4(11.1)	32(88.9)
18.	Candle Matches Fan	11(30.6)	25(69.4)	11(30.6)	25(69.4)
19.	Guitar Bells	17(47.2)	19(52.8)	9(25.0)	27(75.0)
20.	Technology Text	20(55.6)	16(44.4)	16(44.4)	20(55.6)
21.	Phone	29(80.6)	7(19.4)	10(27.8)	26(72.2)
22.	Television	19(52.8)	17(47.2)	10(27.8)	26(72.2)
23.	Radio	22(61.1)	14(38.9)	10(27.8)	26(72.2)
24.	Fuse	29(80.6)	7(19.4)	16(44.4)	20(55.6)
25.	CPU	20(55.6)	16(44.4)	10(27.8)	26(72.2)
26.	Mouse	20(55.6)	16(44.4)	10(27.8)	26(72.2)
27.	Looking Glass	17(47.2)	19(52.8)	8(22.2)	28(77.8)
28.	Photocopy Machine	16(44.4)	20(55.6)	5(13.9)	31(86.1)
29.	Scanner	17(47.2)	19(52.8)	5(13.9)	31(86.1)
30.	Tools and Equipment	19(52.8)	17(47.2)	16(44.4)	20(55.6)
31.	Clay	16(44.4)	20(55.6)	10(27.8)	26(72.2)
32.	Bamboo Stem	13(36.1)	23(63.9)	10(27.8)	26(72.2)
33.	Knife	17(47.2)	19(52.8)	17(47.2)	19(52.8)
34.	Balls	28(77.8)	8(22.2)	28(77.8)	8(22.2)
35.	Video Clips	19(52.8)	17(47.2)	10(27.8)	26(72.2)
36.	Can Opener	17(47.2)	19(52.8)	17(47.2)	19(52.8)
37.	Weighing Balance	8(22.2)	28(77.8)	5(13.9)	31(86.1)
38.	Nose Masks	13(36.1)	23(63.9)	5(13.9)	31(86.1)
39.	Textbooks	29(80.6)	7(19.4)	17(47.2)	19(52.8)
40.	Meter Rules	22(61.1)	14(38.9)	17(47.2)	19(52.8)

Table 2 showed the descriptive analysis of the availability and adequacy of instructional resources and materials for the implementation of Basic Science and Technology in the study area. Considering availability of instructional resources and materials, it could be observed from the table that 24(66.7%) each has wall chats and picture books even as 20(55.6%) each has plastic materials, computers, technology texts, CPU and mouse for the implementation of Basic Science and Technology. In the same vein, 19(52.8%) each affirmed that stove, television, video clips and tools and equipment are available even as 29(80.6%) each has phone, fuse and textbooks. Also, 22(61.1%) each has radio and meter rules even as 28(77.8%) affirmed the availability of instructional resources and materials for the implementation of Basic Science and Technology in the study area. However, results in the table further showed that all the instructional materials and resources are not adequate since their frequencies and percentages are below 18(50.0%) except for wall chats and balls that are the only instructional materials and resources adequate at 24(66.7%) and 28(77.8%) respectively for the implementation of Basic Science and Technology curriculum in lower primary schools in the study area.

Discussion of Findings

Research question two is to determine the availability and adequacy of instructional resources and materials for the implementation of Basic Science and Technology Curriculum in the study area. Instructional resources are available but not adequate in the study area. However, it could be said that since most of the instructional materials/resources are not adequate, the teaching and learning of the BST in the study area would be at a disadvantage. This was in agreement with the work of Etukudo (2014) from their investigation on the factors that affect teaching and learning of Basic Science and Technology in Primary Schools, their result revealed that most of the instructional materials by teachers in our schools according to their research says materials are not available for teaching Basic science and Technology in our Primary schools. They said that the non-availability of resources implies their non-utilization. According to them the non-utilization of the instructional materials by teachers has been revealed by several studies to affect pupil's academic

achievements negatively. The findings also agreed with those of Fakomogbon, Marakinyo (2012) who noted that Basic Technology teachers without adequate instructional materials will find it difficult to impact the right type knowledge to the pupils and that some teachers made no effort to use such materials even when they were within their reach. The study also revealed that the non-availability of instructional materials as major constraints to teachers use of instructional materials to teach pupils the findings of the study were also placement with those of Sambo (2014) conducted in Nasarawa State where the result revealed that most of the facilities for teaching Basic Science were available but they were not adequate and were utilized. This will create a very big problem to the achievement of the curriculum implementation goals in the study area. Abutu (2015) revealed that infrastructural facilities, teaching methodology, instructional resources, trained teachers, the extent to which the curriculum content are taught and funds are not adequately available to a high extent for the effective implementation of UBE programme. This also agreed with the finding of this study. This would also stand as a limitation to effective implementation of the UBE programme. The findings also collaborated with those of Olajide, Adebisi and Tewogbade (2017) in a study on Assessment of Laboratory Resources, Teachers' and Students' involvement in Practical Activities in Basic Science in Junior Secondary Schools in Osun State Nigeria. Those Basic Science resources are not available for teaching in most of the schools. This they said is invariably evidence that instructional resources are lacking to teach effectively. They equally collaborated Adeogun 1990 that a low level of instructional resources are available in public schools and that our public schools are both starved of both teaching and learning resources. This will mean that even though there are adequately qualified teachers for teaching BST in the study area, the lack of adequate instructional resources will ribaldry handicap the teachers and this will in turn hinder effective teaching and learning in the study area.

Conclusion

The study revealed that Basic Science and Technology (BST) can be fully implemented only if there are enough qualified teachers and adequate instructional materials. It was also seen that the teachers were capable in their teaching but lack resources for the teaching, it was also seen that the content of the curriculum were covered by the teachers in the study area. During the research work it was seen in schools that the text supplied to them by Government were not in line with the curriculum, that was why some teachers were unable to teacher what was in the curriculum directly. Some teachers did not use the right methodology to teach the pupils, which have a lot of effect on the pupils. It can be concluded that Basic Science and Technology curriculum implementations is well implemented but can as well be easily improved on due to the qualified and adequate teachers.

Recommendations

1. Schools should be equipped by government with Standard Basic Science and Technology laboratory and other instructional facilities.
2. Government should employ more qualified teachers.
3. Curriculum developer should regularly embark on investigation on how curriculum is being implemented in order to identify places where improvements or innovations are needed.

References

Abutu, J. D. (2015). Evaluation of the implementation of UBE programme in primary schools in Nsukka education zone of Enugu State. *Thesis in the Department of Educational Foundation, University of Nigeria, Nsukka*.

Adejumo, C. C. (2012). Classroom Resources for Effective Communication, Ibadan, Longman Group

Adeogun, A. A. (2001). The principal and the financial management of public secondary schools in Osun State. *Journal of educational system and development*, *5*(1), 1-10.

Fakomogbon, M. A., Morakinyo, O. K., Omiola, M. A., & Ibrahim, K. A. (2012). Assessment of facilities available for teaching Basic Technology subject in the junior secondary schools in Ilorin metropolis. *Interdisciplinary Journal of Contemporary Research in Business*, *3*(10), 4-5.

Oloyede, E. O & Bamidele, E. F (2009). Effect of Using Science & Mathematics Terminologies Interpreted into Local Language as Advance Organizers on The Achievement of Students in Junior Secondary Schools in Junior Secondary Schools in Nigeria. In S. N. Osuji, Y. A. Ajibade, E. O. Oloyede (Eds). *Education for Fullness. Ghana: Damas Education Services Limited. Pg. 131-142.*

Etukudo, D. U. (2014). Factors affecting teaching and learning of basic science and technology in primary schools. *Journal of Educational Policy and Entrepreneurial Research*, *1*(1), 46-58.

Sambo, M. H., Kukwi, I. J., Eggari, S. O., Mahmuda, A. M., & Headquarters, J. A. M. B. (2014). Assessment of the implementation of Basic Science Programme in junior secondary school in Nasarawa West Zone. *Developing Country Studies*, *4*.

Olajide, S. O., Adebisi, T. A., & Tewogbade, T. A. (2017). Assessment of laboratory resources, teachers' and students' involvement in practical activities in basic science in junior secondary schools in Osun state Nigeria. *Journal of Educational and Social Research*, *7*(3), 139-

ASSESSMENT OF INTERNET USAGE AMONG SCIENCE STUDENTS AND ITS IMPLICATION ON BASIC EDUCATION: A CASE STUDY OF MICHAEL OTEDOLA COLLEGE OF PRIMARY EDUCATION, NOFORIJA – EPE, LAGOS STATE, NIGERIA

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Abstract

This study assessed the extent of internet usage by science students and its implications on basic education taking a case study of Michael Otedola College of Primary Education, Noforija - Epe, Lagos. Sample comprised of 253 students who were selected using stratified random sampling technique from the departments of Computer Science, Mathematics, and Integrated Science in the school of sciences of the college. The instrument used for data collection was a questionnaire designed by the researchers with a reliability co-efficient of 0.91. Data analysis was done using frequency counts and t-test. Results indicate no significance difference in the extent of usage of internet based on gender and that science students have sufficient access to the use of internet. Consequently, it was recommended, among others, that government should provide sufficient computers and related computer resources with which to adequately access the internet in all teacher-training institutions in Nigeria.

Keywords: Internet usage, gender, students' achievement, information technology

Introduction

World over, the level of acquisition of western education has become one of the most important instruments for the attainment of national development. Consequently, governments all over the world had continued to place preference on the development of education (Idowu, 2021).In recent times, more attention had been placed on science and technology education because of its role in political, social and economic development. It is however important to note that the internet had played very prominent roles in western educational practice. In contemporary educational practice, the internet which had been regarded an integral component of Information Technology (IT) had, within a very short time become one of the basic building blocks of modern societies. The rapid rate at which IT had evolved since the mid twentieth century, its vast and unprecedented applications had given it a strong role in contemporary development and globalization (Salawu, 2019).

The place of science and consequently technology in the overall development of modern societies cannot be under-estimated. As a result, government at all levels in Nigeria had given preference for science subjects and consequently its teaching in our schools right from primary to tertiary level of education. This is necessary so that Nigeria will not be left behind in the realm of scientific and technological developments that had characterized the twenty-first century

Abubakar and Uboh (2018) have reported significant difference in the extent of use of computers and associated devices among male and female college students. However, Olonade (2018) have reported significant difference in the achievement of science and non-science secondary school students in Mathematics. In recent times, students' academic achievement in science is observed to dwindle. This was corroborated in Akinyemi (2020) and Adekanbi (2019) as both authors in different studies expressed the fact that students' achievement in Basic Science and Mathematics are deteriorating and that the trend needs to be corrected in order for Nigeria to meet up with the challenges of the twenty-first century. In addition, recent advances on social media usage coupled with proliferation of internet-ready mobile phones, i-pads, palmtops, etc had negatively influenced the academic achievement of many students as many of these students now devout more time to social media usage at the expense of their studies. Considering the fact that science teachers have significant roles to play in the school system,