ASSESSMENT OF THE IMPLEMENTATION OF BASIC SCIENCE AND TECHNOLOGY CURRICULUM IN THE MILLENNIUM DEVELOPMENT GOALS (MDGS) AT THE CLASSROOM LEVEL

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Abstract

The paper assessed the implementation of Basic Science and Technology curriculum in the MDGs at the classroom level in Jos metropolis. A survey research design was adopted in the study. Four teachers were selected from each of the 10 schools used for the study giving a total number of 40 teachers. The convenience sampling technique was employed in selecting the schools for the study. The instruments used for data collection were observation and interview schedules. These were subjected to the scrutiny of two experts in the Department of Science and Technology Education University of Jos to ensure their validity. The instruments were further pilot-tested with two primary schools outside Jos metropolis. Pearson product moment correlation coefficient method was used to determine the reliability as 0.93. Six research questions were used to guide the study. The research questions were answered with frequencies and simple percentages. The results showed that the basic science and technology curriculum in the MDGs was not adequately implemented. This was seen from the teachers' inability to use the innovative techniques and strategies, continuous assessment and improvisation of instructional resources in their day today classroom interaction with the pupils as stipulated by the benchmark. The results further showed that most teachers never attended the MDGs retraining exercise. In view of these findings, the researchers recommended that the federal government should employ more proactive ways of retraining teachers for the realization of the MDGs. The retraining should be done either at the school or district level in order to minimize teachers' flimsy excuses for not participating,

such as, distance barriers, among others.

BACKGROUND OF THE STUDY

Science and technology education is considered as a vital tool for national development. It is the basis for the foundation of wealth and development as well as the yardstick for classifying nations of the world as developed or developing. The strength of any nation therefore, depends on the strength of its education system, particularly, its scientific and technological base. This implies that if the educational system of a society is faulty, definitely, the society will be weak. That means that, the weakness of a society or nation is a reflection of its faulty educational system.

Nigeria as a developing nation has witnessed a lot of setbacks in its educational system right from the foundation to the highest level. This has really stunted the growth of the nation. It is lamentable to note that although education has been on the priority list of some previous Nigerian governments, the education system till date has not been able to tackle the challenges of the nation As Moja (2005) puts it, the education system has still not been able to meet the needs of the nation.

The primary school which is typically the first and the foundation laying ground for science and technology education has suffered setbacks. Piwuna and Damar (2004:52) worriedly opined that "the evolution of science in Nigeria for the past two decades has brought a strong awareness that the present form of science which is taught in schools does not prepare pupils to function well in a society undergoing transition..." In the same vein,Unima, Andok and Usoro (2007:4) sadly note that primary education, which is the foundation on which the rest of the education system is built has continued to register more failure than success..."? This according to them is due to lack of adherence to the acceptable educational practice, non-attractive learning environment for effective learning, unavailability of basic facilities, teaching and learning resources generally, poor teacher qualification and the inability on the part of the government to constantly organize refresher courses and workshops for teachers and high teacher-pupils ratio. Furthermore, performance in examination is poor (Moja, 2000).

Experience has shown that Nigerian education has gone through various curriculum innovations. The analysis of the Nigerian education sector reveals the changes and incoherence in policy formation and implementation of the curriculum. Education reforms almost all over the world have shown that curriculum is at the same time a policy and a technical issue, a process and a product involving a wide range of institutions (Ajibola, 2008). The question then, is when shall the educational sector in change for the good of its citizens, particularly, for those at the grass roots with all the reforms it has gone through

especially in the area of science and technology education? How should it be handled at the foundation level, since the foundation determines the strength of the building? In as much as Nigeria wants to be at par with countries of the world that are technologically advanced, it becomes imperative for the nation to take another look at its science curriculum especially with regard to the MDGs. This implies that despite the fact that the curriculum has severally been examined, it does not matter if it is examined again and again not only in its development but also in its implementation context (Piwuna & Damar 2004).

It was in recognition of the inadequacy of the curriculum that the federal government under the MDGs project directed the National Teachers' Institute (NTI) to re-train primary school teachers in Nigeria under the Universal Basic Education (UBE) programme. The scheme which was launched in the country in 1999 and passed into law in 2004 is one of the strategies aimed at implementing the MDGs. The UBE programme is a replacement of the Universal Primary Education (UPE) scheme. It involves six years of primary Education and three years of Junior secondary Education, culminating in a total of nine years uninterrupted schooling and transition from one class to the other, determined through continuous assessment.

The MDGs aim at human development. They are eight goals stipulated to be achieved by the year 2015. In other words, the MDGs are the world's time bound quantified targets and /or most broadly supported goals the world has ever agreed upon. The MDGs provide concrete numerical bench mark for tackling extreme poverty and hunger, achieving universal basic education, promoting gender-equity and empowering women, reducing maternal/ child mortality, improving maternal health, combating HIV/AIDs, malaria and other diseases; ensuring environmental sustainability and developing a global partnership for development. These were adopted by world leaders in the year 2000 and set to be achieved by 2015. The MDGs are both global and locally tailored by each country to build its specific development needs. In Nigeria therefore the MDGs project is monitored by UBE and has made education free, compulsory and a right of every child.

The UBE Commission law section 15 defines UBE as early childhood care and basic education. The law stipulates a 9 year formal education skill acquisition programme and the education of special groups, such as, nomads and migrants, girls and women, 'almajiri', street children and disabled people (Aderinoye, 2007). The federal government of Nigeria in its national policy on education (FRN,2009) emphasizes that basic education particularly in the science aspect, pupils are to be taught to think critically and reflectively to strive to attain

ability to conduct continuous assessment, keep records of pupils' assessment. Teacher's qualifications, the number of times teachers had attended MDGs workshop and the provision of the basic science and technology materials were all captured. In proceeding to collect data, the researchers spent two days visiting the 10 schools selected and obtaining permission from the school authorities to conduct the study in the schools. They requested for the school time table which assisted them in knowing the time allocation for each subject, the schools' starting and closing time. After that, they spent two weeks observing the way the teachers taught, checked assessment records, improvised materials, attendance records and lesson plans, availability and utilization of instructional materials and records of teachers' attendance of the MDGs workshops. The researchers shared the schools selected for the study among themselves and each visited the schools at his/her own convenience within the stipulated two weeks. After the exercise all the data collected were analyzed using frequencies and simple percentages.

PRESENTATION AND DISCUSSION OF RESULTS

This section presents the results of the study on the basis of the research questions, followed by the discussion of the results.

RESEARCH QUESTION ONE

How have teachers implemented the Basic Science and Technology Curriculum in the MDGs with regard to innovative techniques and strategies, continuous assessment and improvisation of instructional materials?

This research question was answered by observing teachers ability to use the methods specified by MDGs workshop manual during their teaching periods. their ability to improvise and use teaching aids in the classrooms, their ability to assess and keep records of pupils assessment, their ability to write lesson plans and to teach based on the lesson plans they have prepared. These were analyzed using simple percentages. These are presented in Table land 2, respectively.

Table 1: Observation of Methods used by Teachers during their Teaching Periods

Methods	Schools										
	A (4)	B(4)	C(4)	D(4)	E(4)	F(4)	G(4)	H(4)	I(4)	J(4)	Total
Lecture	1	4	1	3	2	4	2	4	4	4	29
Project	0	0	0	0	0	0	0	0	0	0	0
Field /Excursion	0	0	0	0	0	0	0	0	0	0	0
Demonstration	1	0	2	1	1	0	0	0	0	0	5
Inquiry	0	0	0	0	0	0	0	0	0	0	0
Process based	0	0	0	0	0	0	0	0	0	0	0

Cooperative learning	0	0	0	0	0	0	0	0	0	0	0
Scaffolding	0	0	0	0	0	0	0	0	0	0	0
Games	0	0	0	0	0	0	0	0	0	0	0
Discussion	0	0	0	0	0	0	0	0	0-	0	0
Concept mapping	0	0	0	0	0	0	0	0	0	0	0
Questioning	2	0	1	0	1	0	2	0	0	0	6

Table 1 shows the list of methods approved by MDGs for teaching basic science and Technology. The table indicates that out of the 40 teachers used in the study, 29 used the lecture method, six used the questioning method and five used the demonstration method during the period under observation. This means that out of the 14 listed methods of teaching, only three were constantly used by the teachers. However, the most frequently used was the lecture method.

Table2: Observation of Teachers' use of Lesson plans, Improvised materials and Continuous Assessment Records.

Method	Schools										
	A (4	B(4)	C (4	D(4	E(4)	F(4)	G(4)	H(4)	I(4)	J(4)	Total
Teachers with lesson plans	3	0	1	2	0	2	1	0	1	0	10
Teachers that used improvised materials during their teaching periods	0	0	0	1	0	0	0	1	0	0	2
Teachers with improvised materials pasted or kept at a corner in their classrooms	1	0	2	0	0	1	2	0	0	0	6
Teachers that kept continuous assessment records of their pupils	0	0	0	0	0	0	0	0	0	0	0
Total	**4**	**0**	**3**	**3**	**0**	**3**	**3**	**1**	**1**	**0**	**18**

The results in Table 2 show that out of the 40 teachers selected for the study, 10 were found with lesson plans, two were observed using improvised materials in their classrooms provided by their pupils as an assignment. Six teachers were seen using improvised materials pasted and kept at a corner in each of their classrooms and no teacher was found carrying out continuous assessment or keeping continuous assessment records. The results show that none of the teachers worked in total compliance with the MDGs/UBE benchmark.

RESEARCH QUESTION TWO

What number of teachers in the sampled schools participated in the MDGs retraining exercises?

In answering this research question, teachers were interviewed on whether they participated in the retraining exercise or not.

Table 3.Number of Teachers that participated in the MDGs Retraining Exercise.

ame of school	Number of teachers in each school	Number attended once	Number attended twice	Number that did not attend
A	4	1	2	1
B	4	0	1	3
C	4	1	0	3
D	4	0	1	3
E	4	1	0	3
F	4	0	1	3
G	4	0	0	4
H	4	0	1	3
I	4	2	0	2
J	4	0	1	1
Total 10	**40**	**5**	**7**	**28**

From Table 3, four teachers from each of the 10 schools selected were interviewed on whether they had participated in the MDGs retraining exercise or not. Five out of the 10 teachers responded that they had participated once, 7 responded that they had participated twice and 28 responded that they had never participated. From this result, it is clear that the number of teachers that had never participated in the MDGs retraining exercise was much more than the number that had participated.

RESEARCH QUESTION THREE

What is the teacher- pupil ratio in the classrooms?

In answering this research question the researchers checked the pupils' attendance registers and made on the spot assessment/ observations of the pupils in their classrooms. This is represented in Table 4.

Table 4: Teacher - Pupil Ratio in Basic Science Classrooms

School	Classes			
	3A	4A	5A	6A
A	40	40	43	40
B	48	47	44	46
C	51	46	44	46
D	48	46	44	45
E	49	47	43	44
F	50	47	44	44
G	47	45	41	43
H	43	40	39	42
I	49	47	48	46
J	49	48	47	44

From Table 4 it is clear that the teacher- pupil ratio is from 1:40 to 1:50. This clearly shows that the number of pupils per teacher was grossly inadequate.

RESAERCH QUESTION FOUR

What is the performance profile of pupils (in basic science and technology) with regard to the implementation of basic science and technology curriculum in the MDGs?

In answering this research question, the researchers went through 2013 end of term examination records of the pupils in classes 3, 4, 5 and 6 in basic science and technology since there were no continuous assessment records. The performance of the pupils were presented as follows:

Table 5.: Performance Profile of Pupils in Classes 3, 4, 5 and 6 with end of term examinations in Basic science and technology in 2013.

Name of school	No of teachers	Class	No of pupils	No score 0-30	No that Percent that scored 0-30	No that scored 40-60	Percent that scored 40-60	No that scored 70-100	Percent that scor 70-100
A-J	10	3	497	140	28	317	64	40	8
A-J	10	4	468	127	27	290	62	51	11
A-J	10	5	455	92	20	309	68	54	12
A-J	10	6	450	95	21	321	71	34	8
Total	40	4	1870	454	24	1213	65	179	11

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F	4	0	1	3
G	4	0	0	4
H	4	0	1	3
I	4	2	0	2
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Table 5indicates that the total number of pupils in classes 3, 4, 5 and 6 that wrote the end of term examinations stood at 1870 and out of this number 454 pupils scored from 0% - 30% with a percentage score *of 24%.* 1213 pupils scored 40% - 60% with a percentage score of 65% and 179 pupils scored 70% - 100% with a percentage score of 11%. The analysis shows that the majority of the pupils that wrote the examinations in 2003 scored between 40 and 60% in basic science and technology examinations.

RESEARCH QUESTION FIVE

How available are the MDGs materials in the schools to take care of the teaching and learning process in line with MDGs project?

In answering this research question, the head teachers and the teachers of the selected classes were interviewed on the materials they used in the schools and classes for teaching basic science and technology. Table 6 shows the results of the interview.

Table 6: Availability of Distributed of MDGs materials to schools

School	A	B	C	D	E	F	G	H	I	J	Total
MDGs Materials	-		-		-	-		-	-	3	30%

Table 6 shows that out of the 10 schools selected for the study only three schools representing 30% of the study sample had some MDGs materials while in the other schools information gathered from the schools by the researchers did not show whether the materials used there were MDGs materials or not.

RESEARCH QUESTION SIX

What are the qualifications of the basic science teachers?

This research question was answered by asking the teachers of the sampled schools their qualifications and their responses were as follows:

Table 7: Qualifications of Basic science and Technology Teachers.

School	B.Ed	B.Sc. Ed.	N.C.E.	M.Ed / M.Sc. Ed.
A	1	1	2	0
B	1	1	2	0
C	1	0	3	0
D	0	1	3	0
E	1	0	3	0

F	1	2	1	1
G	1	1	1	
H	1	0	3	0
I	2	0	2	0
J	1	1	1	1
Total	**9**	**7**	**21**	**3**

Table 7 shows that in the 10 schools used for the study, nine teachers were holders of B.Ed. degree, seven had B.Sc. (Ed.), 21 were NCE holders while three were Masters Degree holders. Or NCE in science and science-related subjects. In most of the schools a teacher assigned to a particular class teaches all the subjects irrespective of his/her field of specialization.

DISCUSSION OF FINDINGS

The findings of the study show that the Basic science and technology curriculum with regard to the MDGs has not yet been adequately implemented at the classroom level. Most teachers had never attended the MDGs workshops and because of that, they were not exposed to innovative strategies for teaching assessing and improvisation of instructional materials recommended by MDGs through the NTI. This scenario is at variance with the emphasis by Mkpa and Izuagba) (2003) that teachers need to acquaint themselves with new techniques and strategies that will enable them handle the population in schools today. For the few teachers that had participated, the outrageous population of the pupils in basic science and technology classrooms would not allow them to teach effectively. Moreover, the MDGs materials were seen not to have been made available to most of the schools. It therefore becomes difficult for the teachers to meaningfully implement the basic science and technology curriculum. Another area of difficulty was the inadequate number of qualified basic science and technology teachers in basic schools. Little wonder, the National Institute (2012) affirmed that the re-training of teachers has not always received the desired systematic attention to update regularly the knowledge and skills of teachers in the light of the changes in the curriculum and the society at large. This has affected the quality of teaching in schools.

CONCLUSION

The successful implementation of curriculum at the classroom level still

appears to be a mirage despite the effort made so far by the government. Much to a large extent depends on what the teachers do in their instructional practices. It should be the desire of every teacher to improve the quality of his teaching in order to ensure meaningful learning on the part of the learners. For teachers to achieve an improved quality of instruction they need to explore a variety of innovative and active teaching strategies, particularly, in the face of increasing population of basic schools.

RECOMMENDATIONS

In the light of the findings of the study the following recommendations were made:

1. Teachers should on their own explore new techniques and effective strategies that will help improve their standard of teaching. The population of pupils in the classroom should not be an excuse to teachers not to teach well or not to explore new techniques and strategies.
2. Continuous assessment should be given the attention and seriousness it deserves by basic science teachers.
3. Teachers should be given incentives by the government to motivate for the work.
4. Teachers salaries should be paid promptly by the government.
5. The Federal government should adopt more proactive ways of re-training teachers for attainment of the MDGs. The retraining should be done in such a way that all teachers are retrained either in their schools or districts and not even local governments, such will minimize teachers exercises of not attending because of distance and other problems.
6. Supervisors should provide follow up programmes after the re training exercise of teachers to ensure its proper implementation
7. Preparation of lesson plans and improvisation should be part of teachers activities before going into the class to teach.

REFERENCES

Aderinoye, O. (2007). Nigerian Education. Retrieve on the 9-09-2014 aten.wikipedia.org/ wild/ Education-17-..

Ajibola, M.A. (20Q8). Innovations and curriculum development to basic education in Nigeria: Policy priorities and challenges of practice and implementation". *Research Journals of International Studies.* Retrieved 16-06-2010 at Journals, com/../509

Eshiet, I.I. (1999). *Science Education National schools curriculum review conference proceedings.* Macmillan Nigeria.

Federal Republic of Nigeria (2009).*National Policy on Education.* Abuja: NERDC. Press.

MDGs (2011). Millennium Project. Retrieved on the 3-09-2014 atwww.Iqralbillion.comyttelys.

Mkpa, M.A., &Izuagba, A.C. (2003).*Curriculum studies and innovations.* Owerri: Media Hall Ltd

Moja, T. (2000).*Nigeria education sector analysis: An analytical synthesis of performance and main issues.* Retrieved on 3-7-2010, atwww.scied.caL/5Q6.

National Teachers Institute (2006). *Manual for the re-training of primary school teachers. School Based Assessment Kaduna. Britex* Printing Press.

National Teachers Institute (2011). *Integrated manual for the re-training of teachers. Basic* Science and Technology, English language Kaduna.: Author

Ornstein, A.C. &Hinkins, F. (1998). What are the roles of teaches incurriculum implementation. Retrieved on the 9-9-.2014 at www.answers.com>answers.com>wikiAnswers>categories>iobs& Education.

Piwuna, C.N. & Damar, D.N.(2004)."The Nigerian science curriculum as an/?agent for Development Jos *Journal of Education,* 7(1)

Unimna, A. Oko, P.I.O. & Usoro, H.S.U. (2007). Problems of implementing Nigerian Philosophy of Education^ *Journal of the Department of Arts and Social Science Education. 1,* 84.