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Constraints And Way Forward To Achieving Effective Science Education Practices Through The Implementation Of Basic Science And Technology Curriculum (BSTC) In Nigeria

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Abstract: ***This paper titled "Constraints and way forward to effective science education practices through basic science and technology education in Nigeria" aims at contributing to the attainment of the goals of science and technology education at the basic education level. The paper discussed the various actions taken so far to achieve the goals of basic science and technology education as part of the basic education in Nigeria. It was noted that the process for basic science and technology effectiveness should incorporate science education practices which are designed to make science education to resemble the way scientists work and think. It was shown that some factors constitute constraints to effective science education practices at the basic education level in the country. Among the constraints identified were the nature of the curriculum, poor funding, dearth of qualified teachers, lack of teacher motivation, lack of facilities and lack of professional training. In order to overcome these constraints and ensure effective science education practices in basic education delivery, it was suggested, among others, that the curriculum of basic science and technology should be reviewed, adequately funded, learning environment improved and teachers adequately motivated.***

Keywords: ***Basic Science, Science education practices, Basic education, science, curriculum***

I. INTRODUCTION

Education remains one of the concepts whose practices enjoy global attention. This is because it is widely accepted as an instrument of positive change and development. The world is prone to changes which affect human societies in different ways. However, problems of common and multi-national nature which evoke generalised approaches to solving them. In particular, globalization of socio-economic, scientific and technological development raises crucial issues of universality of education programmes. It is in response to this universality that at a World Education Conference that was convened in Jomtien, Thailand in 1990, the Conference adopted the Declaration on Education For All (UNDP, 2000). Nigeria was a signatory to the Declaration of Education for All (Obidike and Onwuka, 2013). In order to meet up her obligations to the global movement the Universal Basic Education (UBE) was introduced. The programme was launched in 1999 and legally established in 2004 through the Acts of the National Assembly. The UBE connotes universal education and basic education. Universal here means that the programme is for everyone, irrespective of tribe, culture or race and class (Aluede in Lapo-Popoola, Bello & Atanda, 2009), Basic depicts that which is fundamental or essential thing that must be given or had. It is on this factor that every other thing rests. Without it, nothing may be achieved. It is the root for acquisition of any knowledge (Eddy and Akpan in Lap-Popoola, Bello & Atanda, 2009). UBE is therefore that type of education that every individual must have as a right.

Following the introduction of the UBE, the curricula of education at the primary and junior secondary education levels in Nigeria were reformed (UBEC, 2005). The contents of the new curricula, called the Basic Education Curriculum (BEC), were guided towards the attainment of the goals of EFA, Millennium Development Goals (MDGs), National Economic Empowerment and Development Strategies (NEEDS), and the

Vision 20-2020 (Emechebe, 2012 and Igbokwe, 2015). Basic Science and Technology Curriculum (BSTC) was developed by Nigerian Education Research and Development Council (NERDC) for the Federal Ministry of Education (FME) as part of the comprehensive curriculum initiative (FME, 2015). Between 2008 and date the country has witnessed two major curriculum reform initiatives (FME, 2012 & FME, 2015 and Igbokwe, 2015). Both initiatives affected the BSTC, thus;

- ✓ The 9-years basic Education Curriculum (BEC) (September, 2008-August, 2014), which replaced the primary school and the junior secondary school curricula and
- ✓ The Revised 9-year Basic Education Curriculum (September, 2014-date), which was the latest reform initiative, aimed at addressing the problems of subject overloading and alignment of the curriculum to international best practices in the implementation of EFA programme.

One striking innovation in the Revised 9-year Basic Curriculum was that some subjects were collapsed into clusters/composites. One of the subject curricula of Basic Education Curriculum is Basic Science and Technology Curriculum (BSTC) (FME, 2015).

II. BASIC SCIENCE AND TECHNOLOGY EDUCATION

Basic science and technology is one of the subjects offered in the UBE programme. It is one of the mandatory subjects at the UBE level (FME, 2014). The Basic Science and Technology Curriculum (BSTC) is one of the composite or cluster subjects of the Basic Education Curriculum. The components of Basic Science and Technology subject curriculum are basic science, basic technology, physical and health education and computer science/information technology (IT) (Obioma, 2012; Igbokwe, 2015). The other composite subjects were mentioned by the authors as Pre-vocational subjects (Home Economics, Agriculture and Entrepreneurship) and Religion and National Values (Christian Religious studies/Islamic Studies, Social Studies, Civic Education and Security Education). Igbokwe (2015) noted that the contents of the old primary science, junior secondary school integrated science and introductory technology were lumped into the BSTC. In addition some innovative contents bordering on current issues (like drug abuse, HIV/AIDS and security) incorporated into the curriculum. The objectives of BSTC, according to FME (2012: 3) are to enable the learner:

- ✓ develop interest in science and Technology;
- ✓ acquire basic knowledge and skill in science and Technology ;
- ✓ apply scientific and technological knowledge and skills to meet contemporary societal need;
- ✓ take advantage of the numerous career opportunities provided by science and technology;
- ✓ become prepared for further studies in science and technology;
- ✓ avoid drug abuse and related vices and
- ✓ be safety and security conscious.

The concepts of "Education For All" and "Universal Basic Education" programmes connote that education should be made accessible, affordable and compulsory to all school-age children, adults, nomadic and out-of-school adolescents. The goals of EFA incorporate holistic education (UNDP, 2000). This means that EFA and the UBE in Nigeria should be all encompassing in both quality and quantity. The implication is, not only that all should be taught and taught well, but includes that all should be taught everything that need to be taught at that level. The quest for scientific and technological development of the country makes it imperative that BST should" be properly taught at this basic level. This should be a reflection of the roles of science and technology in the development of human society

The NERDC also developed detailed teachers' guide to the BSC (including BSTC) and organized series of workshops for teachers and other stakeholders on the implementation process. The BSTC was designed to reflect relevance to the developmental needs of the country (Emechebe, 2012). It emphasised the acquisition of craft, entrepreneurial skills and foundation for development of high level cognitive skills of analysis, synthesis and evaluation. The curriculum also aimed at helping school children to acquire knowledge and attitudes necessary for personal life and to prepare for future educational career. The actualization of these aims is dependent on the proper and effective application of the science education practices in the teaching of Basic Science and Technology, with deep appreciation of, the conceptual meanings of the concept of science education practices.

III. SCIENCE EDUCATION PRACTICES

Science has been defined in different ways. Igwe (2003) defined science as knowledge attained through the study of operations of the laws of nature especially that which is obtained, tested, approved and accepted through scientific method. Science is a systematic process of obtaining testable/verifiable knowledge about nature and natural occurrences, utilizing careful observation and experimentation (Okeke, 2007). According to Odo (2012) science is a process through which man obtains testable (verifiable) knowledge of the physical world and utilizes the knowledge to solve human problem. These definitions of science point to the fact that science is human activity, and as such should be learnt by all for knowledge, reasonable existence and active participation in solving the socio-economic problems of the society. Science is therefore part of human culture which should be transmitted to younger generations through a defined process. The process for the transmission of scientific knowledge, attitude and skills to those with less or no knowledge of science is science education. According to Okeke (2007) science education embodies all education processes aimed at providing unlimited opportunities for learners to understand and utilize necessary knowledge, skills and attitudes required to operate effectively in a scientific and technology society.

Holbrook (2011) suggests that science education is an integral part of education and the goals of education are the goals of science education. In general, education aims at producing successful persons who are successful, self-

actualised, active participants in socio-economic activities and informed citizens. According to Holbrook (2011) the essence of science education is to achieve the same aims of education through science education. The essence of education is its ability to transform the learner into a self-reliant person and an active participant in nation building. Science education has the potential of helping the learner to attain this essence. This can be done if science education involves practical approaches that can be likened to true-life practices. These approaches require the incorporation of science education practices in science teaching and learning.

Science education practices are those actions designed to make science education to more closely resemble the way scientists work and think. This helps to create in the learner deeper understanding of scientific ideas over time by engaging in activities that scientists and engineers actually use (Igwe and Nwali, 2015). According to the Academy, the essence of science education practices includes that:

- ✓ All students should have some appreciation of the beauty and wonder of science,
- ✓ Students should possess sufficient knowledge of science and engineering to engage in public discussion on related areas,
- ✓ All students are careful consumers of scientific and technological information related to their everyday lives, and
- ✓ Students should be able to continue to learn science outside school and have skills to enter careers of their choice, including careers in science and technology.

Effectiveness of science education practices therefore is dependent on issues of curriculum, science delivery, assessment and professional development. This will help in attaining the national target of making basic education a means of laying the foundation for a sound scientific and reflective thinking (FRN in Omoifo, 2001).

The nation's commitment in terms of policy to basic science and technology education is not in doubt. As Igbokwe (2015) noted, putting a policy in place is not enough if the implementation process is not as well good. For policies to translate to attainment of goals there should be commensurate commitment to the implementation strategies. The goals of the basic science and technology education can be assessed on the basis of its universality, quality, relevance and efficiency of the implementation variables. The variables include the curriculum, the teachers, learning environment, funding, method of delivery and assessment process as applicable. Where these factors work effectively together they would impact the attributes of science education practices on the learners. But as Emechebe (2012) observed that there seems to be little or no progress in meeting the set goals of basic science and technology education in Nigeria. It is therefore pertinent to examine the constraints to the attainment of the goals and proffer adequate solutions.

IV. CONSTRAINTS TO THE ATTAINMENT OF EFFECTIVE SCIENCE EDUCATION PRACTICES AT BASIC EDUCATION LEVEL

Attainment of goals has been constrained by challenges. Notable among them are the nature and scope of the curriculum, teacher qualification and professional development, political interference, inadequate funding, dearth of trained teachers, lack of incentives and inadequacy of facilities, in no particular order of magnitude of adverse impact.

A. NATURE AND SCOPE OF BASIC SCIENCE AND TECHNOLOGY CURRICULUM

The table 1 shows that basic science and technology is a composite subject curriculum. The composite nature of the basic science and technology curriculum was also highlighted by Obioma (2012). This was part of the 2012 revision of the Basic Education Curriculum.

Theme	Primary Sub theme	JSS Sub theme
Basic Science	•Exploring our Environment •Living and Non things	• Learning about our Environment •You and Energy •Science and Development
Basic Technology	•Understanding Basic Technology •You and Energy	•Understanding Basic Technology •Materials and Processes •Drawing Practice •Tools, Machines and Processes •Safety
Physical and Health Education	•Fundamental Movements •Basic Movements •Athletics •Games and Sports •Health Education •Pathogens, Diseases and Prevention •Drug Eradication •Responsible Parenthood	•Basic Human Movement •Sports and Games •Health Education •Moving our body parts •Athletics •Contact and Non Contact Games
Information Technology(IT)	•Basic Computer Operations and Concepts •Basic Concepts of information Technology	•Basic Computer Operations and Concepts •Computer Application Packages •Basic Knowledge of information Technology

Source: FME in Igbokwe (2015)

Table 1: The structure of basic science and technology curriculum

The revision of the 2008 – 2011 Basic Education Curriculum to the 2012 – date edition was necessitated mainly by the need to reduce curricula overcrowding in terms of subject offering (Okoroma, 2006). However, the reduction of number of subjects affected the basic science and technology curriculum negatively. It resulted to making basic science and technology a composite subject comprising basic science, basic technology, physical and health education and information technology as themes (see table 1 above). The curriculum was further expanded to include novel concepts drawn from contemporary national issues like HIV/AIDS, security education, family life education, entrepreneurial education and drug abuse (FME, 2012). Consequently, basic

science and technology became over-loaded in content. The content overloading is a constraint to effective science education practices in basic science classrooms.

Each of the components requires different but inevitable facilities for effective teaching/learning. These cannot be provided for the implementation of the curriculum, especially when the cluster is viewed as a single subject. Another inherent problem is the challenge of getting subject teachers who are professionally endowed to effectively teach all the components. No doubt there can hardly be a single teacher that has the capacity to effectively teach and assess the contents and skills of all the components of the cluster. As noted by Obioma (2012) it is difficult to return and interprete assessments scores as indicator of learners' performance in a composite curriculum. The school programme time cannot adequately provide for effect teaching of the subject.

The expectation for basic science and technology in the overall programme of universal basic education is that science and technology education should be accessible to all the segments of learners covered by the programme. The curriculum as it is was designed for the formal education sector. The implication is that the almajiris, the nomadic learners and other out-of-school learners have not been covered. The failure to adapt science and technology education to the learning needs of the non-formal sectors has excluded a vast number of basic education learners from gaining the knowledge of basic science education practices.

B. INADEQUATE TRAINING AND PROFESSIONAL DEVELOPMENT PROGRAMME

The type of pre-service training and inadequate professional development programmes for serving teachers constitute challenges to proper integration of science education practices in the basic science and technology. Teachers' professional development encompasses pre-service development programmes. FRN (2004) puts the Nigerian Certificate in Education (NCE) as the least qualification for a teacher in Nigeria. The NCE teacher at the Basic Education level is made to teach all the subjects offered (including basic science and technology) in his class. Similarly, at the upper basic level the basic science teacher is expected to teach all the components of basic science, contrary to his pre-service training. The pre-service teacher programmes at Colleges of Education and Universities are patterned along single subject departments where teachers are prepared to teach basic science, computer science, technology or physical and health education.

Teacher development aims at exposing teachers to the knowledge of content, skills, pedagogy and skills for the assessment of teaching/learning outcomes (Obioma, 2012). As school curriculum undergoes reform, there is need for similar reform in pedagogical contexts at the pre-service teacher education level. The pre-teacher service teacher training programmes in Nigeria have not responded adequately to changes in basic science and technology curriculum. The Integrated Science programme in Nigerian Universities has merely been re-coded basic education programmes to reflect the new curriculum of science education programmes of the universal basic education, without introducing corresponding changes in content and other novel curriculum demands inherent in the BSTC.

The Federal Government embarked on capacity building programmes for teachers of basic education nationwide to ensure teachers' relevance, efficiency and effectiveness in the UBE programme (Obanya, 2010). This was in realization of the fact that no education system can rise above the level of its teacher. The fact is however, that the in-service teachers' professional development programmes are mainly short-time programmes. The duration and quality of the programmes do not provide adequate opportunities to significantly update serving basic science and technology teachers on contents of BST and their professional practices.

C. POLITICIZATION OF EDUCATION

Hamza and Mohammed (2011) noted that education in Nigeria is highly politicized. This affects various aspects of the education system differently. There is uneven distribution of science equipment, uneven distribution of science teachers and polarization in recruitment of teachers. These are often subject to political decisions which favour schools that are linked to members of the political class. The result is that schools that are not so favoured suffer from lack of equipment as well as other instructional materials and inadequacy of teachers. Schools that are victims of politically motivated deprivation lack adequate opportunities for science education practices. Over-politicisation therefore, constitutes a constraint to effective science education practices at basic education level.

D. INADEQUATE FUNDING

The basic education programme is not adequately funded. Aliyu in Hamza and Mohammed (2011) noted that a lot of money is being spent in the name of UBE programme in virtually all parts of Nigeria but only an insignificant portion of the money goes into the programme. The proportion that goes into the programme is inadequate for the provision of critical requirements of basic education such as construction of classroom and furniture, provision of instructional materials, taking care of teachers' welfare, training and retraining teachers, and provision of textual materials. Science education programme that lacks adequate funding cannot ensure effective science education practices. Inadequate funding is therefore, a constraint to effective science education practices in under basic education programme in Nigeria.

E. DEARTH OF TRAINED BASIC SCIENCE TEACHERS

Odili, Ebisine and Ajuar (2011) stressed that the teacher is a critical factor in the successful implementation of any educational innovation. This view is in line with the declaration by FRN (2004) that no education can grow above the quality of the teachers. Accordingly, the teacher's understanding of the curriculum objective, contents, materials and methods is crucial for its effective delivery. Odili, Ebisine & Ajuar (2011) found that basic science and technology teachers do not have clear knowledge of the content and objectives. They are therefore, not guided by the document in

their lesson preparation and delivery. Most of the basic science teachers were not trained with the philosophy content, delivery skills and assessment skills required for effective Basic Science and Technology education in view. They are not therefore professionally disposed to teach the subject as no educational enterprise can rise above the teachers' competence (Nwachukwu, 2012).

The number of graduates of the science-teacher training programmes of the Colleges of Education and Universities is small relative to graduates of other disciplines (Ebonyi State College of Education, Ikwo Convocation List, 2011, Ebonyi State University, Abakaliki Convocation list, 2015). Also of concern is the fact that even the available graduate in science education never specialize in all the components of BST (basic science, technology, computer science/IT and physical and health education). Again most of the teachers at the lower and middle basic levels were not trained to teach science but are engaged in doing that. The basic education programme is therefore critically challenged by dearth of trained teachers that can teach basic science and technology at all levels. This is in line with the finding of Ige (2014), that prevalence of unqualified teachers in schools pose threat to the quality of education. The result is that BST is being taught by mostly teachers who are not equipped professionally to teach them. Highlighting this constraint of dearth of qualified teachers of the implementation of school curriculum, FME (2015:7) reported that "the high quality of the national school curriculum (BSTC inclusive) is undermined by the generally low quality of teachers to implement it, translating into low levels of learning achievement".

F. LACK OF KNOWLEDGE OF APPROPRIATE DELIVERY AND ASSESSMENT TECHNIQUES

Effective basic science and technology would also depend on the science delivery techniques. Basic science delivery involves the methods used by the teacher, the availability and utilization of instructional resources and the teaching/learning environment. The BEC (BSTC inclusive) recommends training of teachers with emphasis on ensuring that teachers develop efficiency in application of leaner-centred approach in curriculum delivery (Emechebe, 2012). The basic science and technology curriculum recommended learner-centred approach that would engage the learners' high level cognitive activities. According to Kazeni in Odo (2012) learner centred approaches are the inquiry approaches .These include constructivism, co-operative learning and laboratory develop process skills and attitudes required for entrepreneurial, technical and scientific growth. The aims are to foster economic growth, increase productivity and initiate bases to create new technologies, products and services. The teachers' professional development programmes of the Federal Government are geared towards equipping the teachers with student-centred pedagogies and the utilization of science equipment in the teaching of basic science.

Assessment is a critical factor in the implementation of a curriculum (Igwe, 2012). According to Obioma (2012) as school curricula are being reformed there is need for school teachers to be equipped with assessment skills that will bring about effective delivery of the curriculum subject matter. The NERDC has developed teachers' guides for BST subject curriculum which incorporates fundamental element of assessment. The aim was to link assessment to instructional objectives and teaching resources. The 9-year uninterrupted UBE programmes implies that certificate examination can only take place at the end of the 9 years .The NERDC was aware of this and has put more emphasis on school based assessment skills which are incorporated into the teachers' guides for BSTC (Obioma, 2012) and necessary for science teachers (Igwe and Nwali, 2015).

The major defects of the assessment of BSTC result from its over dependence on teacher-made tests and the lack of standard. To make assessment to be successful requires that the teacher should be very familiar with the knowledge of the content, philosophy and objectives of the curriculum. Odili, Ebisine & Ajuar (2011) found that most teachers at the basic education level did not have knowledge of the new curriculum. Particularly most teachers lack the knowledge of the overall objective, pupils and teachers' activities. Lack of knowledge of these aspects of the curriculum implies that they cannot be properly assessed by the school teachers.

The programme assessment of basic education outcomes (basic science inclusive) lacks uniformity in standard. Indicators of achievement in one school and/or class cannot be compared with those of other schools and/or classes. The assessment and adherence to indicators of quality assessment, namely content coverage, relevance regularity, skills, difficulty index and evaluation is dependent on the teachers' subjective views

Another difficulty has to do with the delayed evaluative applications of the assessment outcomes. The period from primary 1 to the end of the 9th year of the UBE is too long for taking decisions on the progress made. This particularly affects the BST programme because some topics taught at the lower level may be pre-requisites for the effective study and understand.

G. LACK OF TEACHER MOTIVATION

According to Odili, Ebisine & Ajuar (2011), teacher motivation is central to the overall task of curriculum implementation. If the teacher is to play the required critical and central roles efficiently, his status and morale should be high. UNDP (2000) noted the need for raising the status and morale of teachers in order to harness their potentials for attainment of the goals of basic education. Teacher motivation is therefore, paramount for the basic science and technology curriculum to be properly implemented. This is because if the teacher's personal needs are satisfied he will perform optimally, willingly and efficiently to achieve the goals of the curriculum. Van Horn and Van Meter in Okoroma (2006) identified dispositional conflicts as one the explanations for unsuccessful implementation of education policies. If the teacher refuses to carry out his own assignment in the wheel of curriculum implementation process, the goals of the curriculum cannot be attained. Ige (2014) observed that most teachers in Nigeria are not committed to their job. Many indulge in non-professional practices as reactions to persistent low and irregular remuneration, non-payment of allowances, denied promotion

and dissatisfactory working conditions (Hamza and Mohammed, 2011). Lack of motivation of teachers is a serious constraint to effective science education practices.

H. POOR LEARNING ENVIRONMENT

The participant of the Darkar Framework for Action on Education For All pledged to "create safe, healthy, inclusive and equitably resourced educational environment conducive to excellence in learning with clearly defined levels of achievement for all" (UNDP 2000:3). Learning environment includes infrastructure for learning, instructional resources, functional laboratories, light and water. According to Igbokwe (2015) relevant materials and infrastructure are necessary for the realization of the ideals of basic education. The author noted specifically, the need for computers, functional laboratories and learner-centred textual materials as basic requirements for successful basic education. It follows that effective basic science and technology education requires that provision should be made to ensure adequate and conducive learning environment.

The teaching and learning facilities are inadequate (Okoroma, 2006, Nwachukwu, 2012, Ige, 2014). Similarly "Infrastructure and furniture are inadequate and in dilapidated states; sanitary facilities and toilets are inadequate" (FME, 2012: vii). Observations also show that most of the available ones are not functional. The non-availability of materials and general poor learning environment constitute major constraints to basic science education practices in basic schools in Nigeria.

V. THE WAY FORWARD

As way forward for effective science education practices through basic science and technology subject under the basic education in Nigeria, the following could be considered:

- ✓ The Basic Science and Technology Curriculum should be reviewed with the view to reducing the contents and make its goals achievable. This can be done by removing from the curriculum topics that do not have direct bearing on the learners' immediate environment.
- ✓ The curriculum should be made available to every teacher of basic science and technology. There should be workshops for all the teachers who teach basic science and technology at all levels of basic education. The outcomes of the workshops should enable the teachers to align the philosophy and goals of the curriculum to the contents, activities, pedagogies and assessment skills. By so doing the teacher would be more endowed with the professional background to enhance effective science education practices;
- ✓ The curricula for pre-service teacher training of colleges of education and faculties of education of the universities should be reviewed and restructured by the appropriate authorities. In reviewing and restructuring the curricula, the innovations in the goals, contents, skills, pedagogies and assessment skills of the basic and technology curriculum should be incorporated, while outdated contents should be removed. The aim should be to align the training programmes to the expected work responsibilities and practices of the trainees and make the teachers-to-be more prepared for effective science education practices in science classes.
- ✓ Teachers who teach basic science and technology at all basic education levels should be encouraged to attend and participate in workshops and conferences, to register and participate in professional associations relating to science and technology, like the Science Teachers' Association of Nigeria. This will broaden their vision and increase their capacities as basic science and technology teachers.
- ✓ Adequate fund should be made available to Colleges of Education and Faculties of Education in the Universities to enable them effectively discharge their responsibilities of producing basic science and technology teachers. Such special funds should also be used to retrain science educators in the colleges and universities to increase and re-align their capacities along the line of the innovations in the basic science and technology programme, and hence facilitate science education practices in basic science and technology delivery.
- ✓ The science and technology curriculum should not be a straight-jacket single document. Versions of the curriculum adapted to the learning needs of all the segments of the basic education should be developed. This will make basic science and technology inclusive, taking care of the formal, non-formal, almajiris and nomadic segments of the basic education. To make the adaptation effective, there should be special training programmes for teachers of basic science and technology to be able to adapt to the special features.
- ✓ Teachers should be properly motivated through regular and commensurate payment of salaries. This will attract people who are more endowed intellectually into the teaching profession and ensure their retention. Teachers who teach basic science and technology at the upper basic level should be given special incentives such as science allowances and insurance covers to enhance commitment of more energy, time and creativity into their job.
- ✓ More funds should be committed to enhancement of the learning environment by providing adequate and conducive learning space, light and water to basic education institutions.
- ✓ Functional laboratories should be designed and designated for basic science and technology should be provided, for junior secondary schools while each primary school should be provided with adequate science kits for basic science and technology.
- ✓ Universal basic education connotes the universality of access to quality education for all. This requires that governments at all levels put in place and ensure the enforcement of measures against reckless politicization of resource distribution for the basic science and technology programme at all levels of basic education.

VI. CONCLUSION

There is general acceptance of the fact that development could only be meaningful if and when it is science and

technology driven. Growth and development of science and technology is dependent on the effectiveness of science and technology education. Basic Science and technology education is the fundamental science and technology project. It is the vision of the basic science and technology programme in Nigeria to facilitate the socio-economic development of the country. To achieve the vision, science and technology should be taught and learnt in such ways that the basic education learner will embrace science education practices as part of his overall education. This cannot be achieved in the face of the prevailing constraints to the process of science and technology education in Nigeria. This makes it expedient that every stakeholder should play positive and conscious roles to see to the implementation of the way forward in order to find solutions to the constraints to effective science education practices in basic education programmes in Nigeria.

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