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# AN ANALYSIS OF THE NEW 9- YEAR BASIC EDUCATION MATHEMATICS CURRICULUM IN NIGERIA

**Adeneye O. A. Awofala**

**Abstract:** The intention of this paper is to describe and reflect on the changes in the new 9-year basic education mathematics curriculum in Nigeria. The paper is divided into four major themes: history of curriculum development in mathematics education at the basic education level in Nigeria, the motivations for the revision of the primary and junior secondary education mathematics curricula, the development process of the new 9-year basic education mathematics curriculum, and the distinctions between the old mathematics curricula and the new 9-year basic education mathematics curriculum.

**Key words:** basic education, mathematics curriculum, curriculum development, curriculum reform

## 1. Introduction

There is no doubt that primary education is the foundation upon which the rest of the educational system is built. Among primary school subjects, mathematics has been at the centre of reform in basic education (Awofala & Awolola, 2011) and mathematics curriculum has also been regarded as a very core aspect of mathematics education at the basic education level (Awofala & Awolola, 2011). In Nigeria, the Federal Ministry of Education through the National Council on Education (NCE) has recently approved and released the new 9-year basic education mathematics curriculum to schools. This curriculum is a product of the revised, restructured, re-engineered and re-aligned primary and junior secondary schools mathematics curricula to fit into the 9-year basic education programme. In context of this paper, basic education comprises six years of primary education and three years of junior secondary education. However, effort is made to discuss and reflect on the innovations in the new 9-year basic education mathematics curriculum in Nigeria. Precisely, the paper discusses the history of curriculum development in mathematics education at the basic education level in Nigeria, the major motivations for the new 9-year basic education mathematics curriculum, and the development process and salient features of the new curriculum.

## 2. History of Curriculum Development in Mathematics Education at the Primary and Junior Secondary Schools in Nigeria

Prior to the advent of the Christian missionaries and the subsequent introduction of 'Western-style' schooling, various ethnic groups in Nigeria used elaborate counting systems which were taught to the young ones in informal ways.

Taiwo (1968) has stated: "*The Yoruba have developed a system of counting and have used a variety of human experience to promote practice and dexterity in enumeration. The Yoruba child is introduced early in life to counting by means of concrete objects, counting rhymes, folklore, plays, and games, at home and on the farm." (p. 8-10).* Other ethnic nationalities such as the Igbos, Hausas, etc demonstrate similar activities related to mathematics

When the 'new education' was introduced by the Christian missionaries in about 1842, although the first European contact with Nigeria dated backed to 1472, its curriculum centred on Bible reading and later arithmetic became one of the components of the curriculum. However, the eventual colonialisation of Nigeria by the British government did not change the content of the primary school mathematics component of the curriculum instituted by the Christian missionaries up to the end of the 1930.

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The twentieth century, witnessed a worldwide reform in mathematics education. This reform brought about by different social problems was in recognition of new technological developments which called for a complete restructuring and reorganization of mathematics curriculum to meet the growing need of mathematics as a touchstone of intelligence and whetstone of scientific and technological innovations. However, two major reforms that swept the United States, Britain and some other developed countries in the mid century of the last millennium had a great impact on primary mathematics curriculum in Nigeria.

The first reform, which started in the early 1930s and climaxed in the 1950s, witnessed changes in aims, content and organization of primary mathematics education. This period frequently called the "meaningful arithmetic" era had its own distinct mathematics curriculum. The curriculum was largely arithmetic process based as topics in algebra, geometry and trigonometry were not taught. The rote learning of computational skills which pervaded the period before the reform was replaced with incidental learning which emphasized informal contact with numbers and numeration. The focus on the meaning of mathematics at that time was methodological while the content was given a new setting rather than a change (Osibodu, 1988). The first reform based on the insightful learning principle witnessed the production of arithmetic textbooks for primary school which were adapted for use in Nigeria. Badmus (1977) has indicated the general nature of the mathematics studied during this period when he stated:

"*In summary, we find that between 1930 and 1960 three books – Efficiency Arithmetic, A Shilling Arithmetic, Larcombe Arithmetic Series – were popularly adopted as Arithmetic class-texts in primary schools in various parts of Nigeria. These books contain topics which could be described as arithmetic processes and nothing more. p.15"*

The second reform dominated by the emergence of modern mathematics curriculum started in the early 1950s and reached its climax in the 1960s. The reform became more intensified in the 1960s as a result of the successful launching of the *Sputnik*, the first earth satellite in space in November 1957 by the former Union of Soviet Socialist Republic (USSR). Mathematics was considered as the backbone of this technological breakthrough. This period witnessed radical departures from the meaningful arithmetic era to a technologically driven modern mathematics curriculum. The reform brought about the establishment of school mathematics curriculum projects, such as the American School Mathematics Study Group (SMSG) Project – 1958 , the British School Mathematics Project (SMP) – 1962, the University of Illinois Committee on School Mathematics (UICSM) Project – 1958, the Greater Cleveland Mathematics Programme (GCMP) – 1959, and so on (Osibodu, 1988). All these projects headed mostly by mathematicians had great impact upon the elementary mathematics curriculum development in Africa, and in Nigeria in particular.

Going by this it is clear that some change in mathematics curriculum was desirable in the years immediately following independence. Indeed, some months before the attainment of nationhood a call was made for curriculum reform in all of Africa. It was at the International Conference on Science in the Advancement of New States at Rehovoth, Isreal, in July, 1960. The call at Rehovoth became concretized when the Endicott House Conference held at Delham, Massachusetts in 1961 initiated the African Education Programme. Those present at the conference were mathematicians, scientists, educationists and school teachers from Ghana, Nigeria, Sierra Leone, Uganda, the United Kingdom and the United States of America. The general purpose was to assist African scholars and educators to mount within Africa massive curriculum reform programmes of the sort that had been so influential in other parts of the world.

The reform saw the inclusion of topics such as negative numbers, practical geometry, statistics and probability in the Nigerian primary modern mathematics curriculum. It also made possible the establishment of the African Mathematics Programme (AMP) – 1962. The African Mathematics Programme (AMP) otherwise called the Entebbe Mathematics was saddled with the responsibility of preparing and producing teaching textbooks for use in schools, teacher training colleges and in-service institutions; trial teaching and testing of the already produced materials in various schools and colleges and the quantitative and qualitative training of teachers and tutors in the proper use of materials produced. The first writer's workshop at Entebbe attracted 54 participants from 13 countries, including

Nigeria. Subsequent workshops at Entebbe and Mombasa were attended by Nigerian participants. It is well known that the programme, which consisted of intensive residential workshops, took place between 1962 and 1969, and produced more than 80 mathematics texts of various descriptions for primary and secondary schools as well as for teacher training and sixth form colleges. The most successful AMP project in Nigeria was the Lagos experiment which commenced in January 1964 under the directorship of Professor Grace Alele Williams. Modern mathematics became operative in all primary schools in Lagos State in 1971.

Unlike the AMP which Nigeria actively participated in, Nigeria declined to participate in other programme such as the West African Regional Mathematics Programme (WARMP) established in 1970 with no concrete reason. The WARMP comprised Sierra Leone, Ghana and Liberia and was funded by the United States Agency for International Development (USAID) through the Education Development Centre (EDC) of Newton Massachusetts. Though short-lived, the WARMP had three major goals:

1) To assemble mathematicians and mathematics educators capable of engineering mathematics curriculum development in the member countries;

2) To produce a regional adaptation of the textbooks written during the African Mathematics Programme and;

3) To disseminate information on modern mathematics to mathematics educators, tutors and supervisors (Ohuche, 1978).

In what could be described as the first indigenous reform in mathematics education in Nigeria started in 1969, when the Federal Military Government established the Nigerian Educational Research Council (NERC) (now the Nigerian Educational Research and Development Council- an amalgamation of four distinct institutions: the Nigerian Educational Research Council, the Comparative Education Study and Adaptation Centre, the Nigerian Book Development Council, and the Nigerian Language Centre via decree 53 of 1988) to formulate a national philosophy of education and to promote the work of modernization of school curricula in various subjects at all levels of education. However, the NERC in conjunction with the Institutes of Education in various universities organized conferences, seminars and workshops to intimate primary school teachers with the modern mathematics programme.

Although the report of the Lagos pilot study on modern mathematics conducted between 1964 and 1968 indicated a huge success as declared by Grace Alele Williams, it could not be said for other states of the federation. The acute shortage of qualified modern mathematics teachers and materials weakened the move for a large scale introduction of modern mathematics programme to every nook and cranny of the country. Also, the East had just come out from the severe Nigerian Civil War of 1967-1970 which, led to the destruction of lives, properties, schools and the disruption of educational careers of many students in the area. In the North, there was the age-long problem of educational gap between the educationally advanced south of the country and the less educationally developed north – dating back to the early colonial prohibition of Christian mission schools in Muslim dominated areas. By the mid-1970s, criticisms on the unsuitability of the modern mathematics programme to our needs and aspirations had reached crescendo and in January 1977, the abolition of modern mathematics programme in Nigeria was announced by the Federal Commissioner of Education, Dr (Col.) A. A. Ali at a conference in Benin purportedly organized to give appropriate advice to Government on the content and methodology of school mathematics. Instead a return to traditional mathematics was enforced.

The aim of organizing the Benin conference was hardly achieved and sensing public outcry on the deteriorating situation with respect to mathematics education in the country, coupled with the confusion resulting from the Benin conference the National Task Force set up by the NERC in July 1976 with the aim of studying the problems facing the teaching of mathematics in Nigerian schools and Colleges swung into action and met at the University of Ibadan in February 1977. The Task Force had the following terms of reference:

1) To examine the different aspects of the controversy on the teaching of 'modern' or 'traditional' mathematics in Nigerian schools;

2) To examine the existing school mathematics curricula in light of this controversy and spotlight the problems and issues, and;

3) To make concrete proposals for the development of appropriate mathematics curricula for the different levels, including suggestions for their implementation (Akintola, 1977).

At its first plenary session, it reaffirmed the recommendation made at the Benin conference that, "The Federal Government should introduce mathematics, not just arithmetic, into all Nigerian schools." Furthermore, the Task Force (NERC; 1977, p.2) agreed

1) That there would have been no controversy, if there had been adequate information and publicity about the rationale behind the modernization of the mathematics curriculum.

2) That the core of mathematics is the same in both the so-called 'traditional' and 'modern' mathematics and the difference is the shift in emphasis from rote learning and heavy computation to learning with understanding with an eye on its applicability to everyday life.

3) That the task of teaching mathematics has been further aggravated by the inadequacy of teachers and increased enrollment at the primary and the secondary levels of the system far in excess of our capacity to produce teachers.

4) That most of the arguments advanced against 'new' mathematics have been based on sentiments, personal biases, and isolated cases and have not been advanced by people who have made a sound evaluation of the situation. These criticisms should, therefore, be evaluated in the light of the background and related experiences of the critics.

Following the plenary session, two working groups-one on primary and teacher education and the other on junior and senior secondary-were formed. These two groups worked independently of each other on the curriculum, the teacher, teaching aids and school management for the appropriate levels. Government acceptance of the Task Force recommendations led to new curriculum guidelines for the appropriate levels. Also, the effort of the Comparative Education Study and Adaptation Centre (CESAC) in the University of Lagos in dealing with the problems of the school mathematics curricula could not go unnoticed. CESAC was established at the University of Lagos in 1967 with an initial grant from the Ford Foundation on the approval of the Federal Ministry of Education and the National Universities Commission. In 1976, the CESAC held a series of workshops and conferences aimed at developing a new syllabus for secondary school mathematics. In October 1977 the National Council on Education (NEC) met to coordinate the activities of the NERC and CESAC and not until March 1978 that the work of these various groups were presented at a National critique workshop held in Onitsha. The conference adopted the NERC primary syllabus and curriculum with only minor modification while that of the CESAC secondary syllabus which did not follow the new structure of 6-3-3-4 system as contained in the National Policy on Education (FRN, 1977) was reworked into two syllabi-the junior secondary mathematics syllabus and the senior secondary mathematics syllabus. The new syllabi were approved by the Federal Ministry of Education in 1978. The contents of the syllabi represented a compromise between the 'traditional' and 'modern' mathematics. Whereas the 'modern' mathematics emphasized concepts formation and logical thinking, the 'traditional' mathematics placed emphasis on manipulative skills. The official implementation of the primary mathematics curriculum took effect in 1979 while the junior secondary mathematics curriculum was officially introduced to junior secondary schools in 1982 and was in use for 26 years without any meaningful revision.

The launching of the Universal Basic Education (UBE) Programme as an educational reform policy in 1999 by the Federal Government of Nigeria set the stage for a complete overhaul of the primary and secondary schools curricula. One of the basic features of the UBE programme is the disarticulation of junior secondary school from senior secondary school and its re-alignment with primary school. This disarticulation agenda among other major motivations necessitated the review of the existing primary and junior secondary education curricula to fit into the 9-year basic education programme. The change in the primary and junior secondary mathematics education curricula is part of this larger scale reform agenda. It should be noted that the review of the existing school curricula which started in 2001

through a grant from the Education Tax Fund (ETF) now Education Trust Fund did not stop until 2007 when a new 9-year basic education curriculum was approved by the National Council on Education for national implementation in 2008.

## 3. Motivations for the Revision of the Primary and Junior Secondary School Curricula

Effort is made to discuss four major motivations for the revision of the primary and junior secondary education curricula. These are (a) meeting the needs of the Universal Basic Education Programme (b) promoting the ideal of National Economic Empowerment and Development Strategy (NEEDS), Education For All (EFA) and Millennium Development Goals (MDGs) (c) the need to produce better informed, Information and Communications Technology (ICT) compliant, bilingual citizens of high ethical standard, (d) problems with the previous curricula, and (e) keeping pace with emergent global and national issues.

### a) Meeting the needs of the Universal Basic Education Programme

The Universal Basic Education Programme was introduced in 1999 by the Federal Government of Nigeria as a reform programme aimed at providing greater access to, and ensuring quality of basic education throughout the country. Nigeria's long-standing wish to ensure an uninterrupted access to 9-year formal education by providing FREE and COMPULSORY basic education for every child of school-going age under: (i) six years of primary education and (ii) three years of junior secondary education motivated the Nigerian Educational Research and Development Council (NERDC) to revise the existing primary and junior secondary schools curricula to fit into the 9-year basic education programme and improve the level of teaching standards. This reform is not restricted to the 9-year basic education curriculum as the senior secondary school curricula also received a touch.

### b) Promoting the ideal of NEEDS, EFA and MDGs

In 2000, world leaders met in New York City to adopt the United Nations Millennium Declaration, committing their nations to global partnership to reduce poverty, and agreed to a time-frame for ending global poverty and other issues by 2015, which are known as the Millennium Development Goals (MDGs). There are 8 MDGs which range from eradicating poverty and hunger, promoting gender equality and empowering women, ensuring environmental stability, reducing child mortality, to combating HIV/AIDS, malaria and other diseases. Nigeria as a signatory to the United Nations prepares to achieve the MDGs by 2015 through a functional basic education and in 2004 devised a homegrown economic blue print known as a the National Economic Empowerment and Development Strategy (NEEDS) to generate wealth, create employment, eradicate poverty and engage in meaningful planning in education. All these provided the enabling environment for the review of school curricula to fit into the implementation and actualization of the ideal of NEEDS, EFA and MDGs.

### c) The need to produce better informed, ICT compliant, bilingual citizens of high ethical standard

The education of the mind has always been the cardinal goal of every education system. The need to produce better informed, ICT compliant, bilingual citizens of high ethical standard is one motivation for the review of school curricula. The old curricula were neither ICT driven nor civic education oriented. It was lacking in French language. Educating the mind is developing the nation and it is only through a functional and responsive curriculum that the minds can be cultivated for a meaningful development and contribution to nationhood.

### d) Problem with the previous curriculum

The Nigerian Educational Research and Development Council – the developer of the new 9-year basic education curriculum – identified major handicaps of the content and implementation of the curricula that had been in place during the last 26 years. These problems fit into the content, pedagogy and assessment. Here, we mention the major problems and how they were solved in the new 9-year basic education curriculum.

In the old mathematics curricula greater emphasis was given to process evaluation as opposed to product evaluation. Assessment of students' learning was test and examination driven with no

consideration for projects and group works as alternative assessment tools. This arrangement did not fit into the constructivist approach to learning in which learners engage in meaningful construction of their own knowledge of mathematics. It was also a negation of the aims and objective of the new approach that emphasizes the process of learning and the development of generic skills. Generic skills in this context are defined in terms of macro and micro skills. Macro skills include inquiring, conceptualizing, problem-solving, communicating, quantitative reasoning, connections and information technologies whereas micro skills include computation, mental calculation and estimation (Awofala & Awolola, 2011). These concerns in the area of assessment of students' learning, meaningful construction of knowledge and development of generic skills became part of the bases for renew interest in the revised curriculum. In the previous curricula doing mathematics was perceived as applying a set of rules rather than as a thinking process.

Another problem with the previous curricula was the way the mathematics content was delivered. Emphasis was placed on traditional methods of instruction in which students engaged in memorization of facts through rote learning. In this way students were unable to engage in meaningful mathematics learning and students' motivation to learn was at its low ebb. The need to teach mathematics with student-centred strategies was a major concern of the NERDC as it revised the curricula.

In the new 9-year basic education curriculum, such constructivist pedagogies as active learning, use of manipulatives, cooperative learning, and the use of realistic and genuine tasks are emphasized at the expense of traditional methods of teaching. In active learning, students engage the material they study through reading, writing, talking, listening, and reflecting. Evidence suggests that the quality of teaching and learning is improved when students have ample opportunities to clarify, question, apply, and consolidate new knowledge (Awofala & Awolola, 2011). Through active learning, teachers create opportunities for students to engage new material, serving as guides to help them understand and apply information.

Furthermore, apart from content overload which did not encourage the use of those teaching and learning strategies that promote skills development, the old curricula became due for revision in the area of content organization and content alignment with quantitative reasoning tasks. Content in the old curricula was organized based on how teachers teach and topics were not aligned with quantitative reasoning tasks and very few examples of realistic mathematics were given. These shortcomings in the area of curricula content were overcome in the new 9-year basic education mathematics curriculum as curriculum content is evenly distributed so as to encourage the use of facilitative teaching and learning strategies. Every topic in the new curriculum is associated with quantitative reasoning task to facilitate the development of problem solving and psychomotor skills and daily use of mathematical knowledge is emphasized.

### e) Keeping pace with emergent global and national issues

One of the criticisms levelled against the old curricula was that the curricula did not keep pace with emergent global and national issues, hence the need for revision. These emergent issues according to Adeniyi (2004) include youth unemployment and restiveness; drug abuse, trafficking and adulteration; indiscipline and values re-orientation; sexually transmitted infections (e.g. HIV/AIDS); gender issues; peace education and conflict resolution strategies; information and communications technology; deregulation; human rights issues; religious and ethnic conflicts; poverty; child labour; corruption; as well as cultural identity and pluralism. In the new 9-year basic education curriculum these emergent issues are well integrated without overloading the content of the school subjects particularly mathematics.

## 4. Development Process of the new 9-year Basic Education Mathematics Curriculum

Following the decision of the Federal Government of Nigeria to introduce the 9-year basic education programme as a means of attaining the Goal number 2 of the MDGs which centres on achieving Universal Primary Education by 2015 and the need to attain the critical targets of the NEEDS, the National Council on Education (NCE) at its meeting in Ibadan in December 2005 directed the NERDC to review, re-structure, and re-align the existing curricula for primary and junior secondary school to fit into the 9-year basic education programme. At the meeting, the NCE approved a new curriculum structure for basic education namely: Lower Basic Education Curriculum (Primary 1-3), Middle Basic

Education Curriculum (Primary 4-6) and Upper Basic Education Curriculum (JSS 1-3), listing relevant subjects for each level.

Based on this directive, a High Level Policy Committee on Curriculum Development (HLPC), made up of critical stakeholders and chaired by the NERDC, took the initiative to provide the policy guidelines for re-structuring the curriculum. Between January and March 2006, the NERDC convened a meeting of experts and also organized several workshops to produce the 9-year basic education curriculum. This curriculum ensures continuity and flow of themes, topics and experiences from primary school to junior secondary school level. At NERDC, curriculum review, like the development process, is a five-stage process of planning, writing, critique, editorial and presentation of curriculum to the Joint Consultative Council on Education (JCCE) and National Council on Education.

At the planning workshop which was the first stage of the curriculum review, mathematics teachers, mathematics educators, policy planners and experts from the industry from across the six geo-political zones of the country were invited and constituted into a panel. These experts brought their robust participation to bear on the content and schemes of the curriculum. At the writing workshop, which was the second stage of the curriculum review, members of the subject panel were expanded and they diligently wrote the objectives, contents, instructional materials, classroom activities and evaluation method of the school mathematics at the primary and junior secondary school levels. Next was the critique workshop made up of teachers and policy experts who were markedly different from those who wrote the mathematics curriculum. The critique panel, which evaluated the curriculum, had a chairman who was independent of the subject panel. The editorial workshop was the last stage of the curriculum review where experts in mathematics and mathematics education were brought in to edit the final draft of the curriculum. This final draft of the mathematics curriculum also went through three approval processes. It was first presented to the JCCE Reference Committee where it was subjected to further discussion. On passing the committee's scrutiny the draft curriculum was forwarded to the plenary session of the JCCE for further deliberation. It was from there that the final draft of the mathematics curriculum went to the NCE after a rigorous assessment. Figure 1 below shows the NERDC five-stage process of curriculum development/review.

Thus, the new 9-year basic education mathematics curriculum went through all these stages before it was finally approved by the NCE in September 2007. The implementation of the new 9-year basic education mathematics curriculum started nationwide in September 2008, in all primary and junior secondary schools, a year after it was approved by the NCE. The system-wide and sequential approaches to implementation were adopted. The system-wide approach involved the simultaneous introduction of the new 9-year basic education mathematics curriculum throughout the country while the sequential approach involved the initial introduction of the curriculum in just one level of the educational system and in a period of time say one year it is extended to other levels in sequence. This gradual and phased implementation strategy employed in the three years of pilot-testing (September 2008 – August 2011) of the new 9-year basic education mathematics curriculum is to ensure the realization of the goals of the UBE programme for which reason the new 9-year basic education (mathematics) curriculum was developed. The three years of pilot-testing is expected to give ample opportunity to critical stakeholders and mathematics teachers other than those who participated in the development process, to articulate their positions based on empirical observations of the missing elements in the curriculum; collate and forward them to the NERDC for incorporation during the planned review formally scheduled to commence in September 2011.

## 5. What is "New" in the new 9-year Basic Education Mathematics Curriculum?

The new 9-year basic education mathematics curriculum changes are detailed in table 1. The table shows detailed comparison of the new 9-year basic education mathematics curriculum with the old primary and junior secondary mathematics curricula (Awofala & Awolola, 2011).

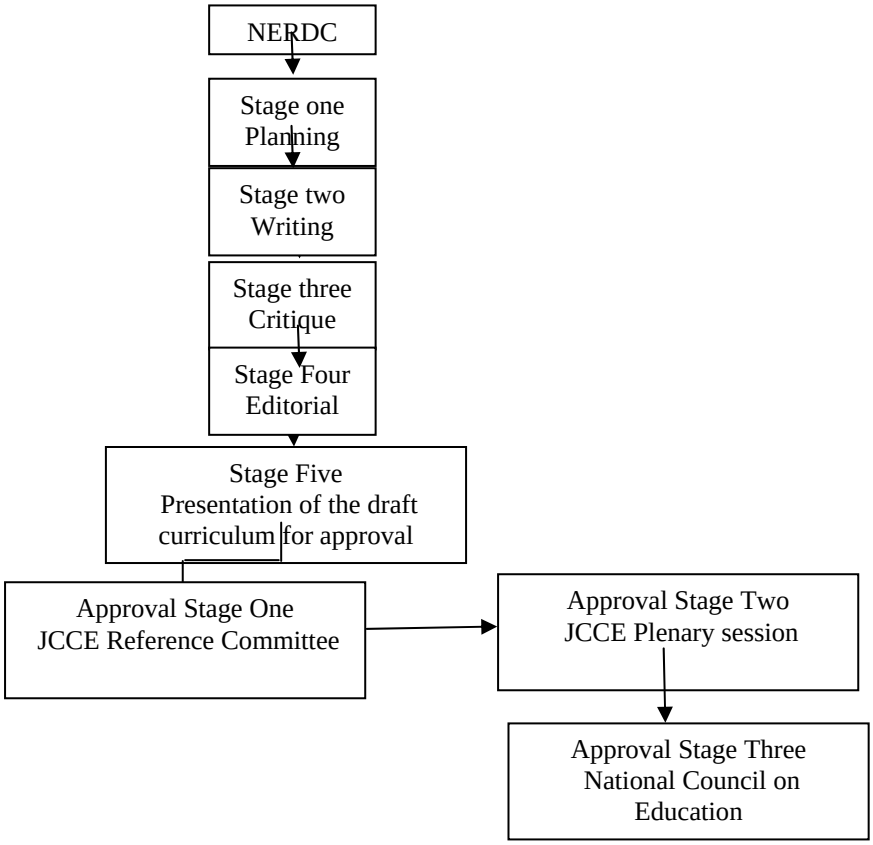


**Figure 1:** *NERDC Five-Stage Process of Curriculum Development/Review*

**Table 1:** *Differences between the old primary and junior secondary mathematics curricula and the new 9-year basic education mathematics curriculum.*

| **Old primary and junior secondary mathematics Curricula** | **New 9-year basic education mathematics Curriculum** |
|---|---|
| No distinction between students' and teacher activities. | Activities are broken down into students' activity and teacher activity. |
| No sample evaluation item to guide the teacher | Evaluation guide consists of sample evaluation items to guide the teacher. |
| Topics are not aligned with quantitative reasoning tasks. | Every topic in the curriculum is associated with quantitative reasoning tasks to facilitate the development of problem solving and psychomotor skills. |
| Content is organized based on how teachers teach. | Content is organized based on how students learn. |
| There is little mention about developing positive attitude in students. | There is more emphasis on how to develop positive attitude towards mathematics and on student motivation. |
| Teaching methods, techniques and strategies are not student-centred. | Teaching-learning activities prepared parallel to learning outcomes require student-centred methods, techniques and strategies |
| The existing primary and junior secondary schools mathematics curricula truncate the 9-year | The new basic education mathematics curriculum gives room for the 9-year continuous schooling. |

| | |
|---|---|
| continuous schooling. | |
| There are few sample activities that require the use of manipulatives | Virtually all of the sample activities show how to use manipulatives for students' construction of knowledge. |
| There are few examples of realistic mathematics. | Daily use of mathematical knowledge is emphasized. |
| Curricula content overload which does not encourage the use of those teaching and learning strategies that promote skills development. | Curriculum content is evenly distributed so as to encourage the use of facilitative teaching and learning strategies. |
| Academic nature of the old mathematics curricula made it to loose touch of basic learning for life long survival. | The curriculum is interspersed with skills for lifelong survival. |
| No adequate representation of emerging issues. | Emerging issues such as HIV/AIDS are well represented. |

However, the core content of the new 9-year basic education mathematics curriculum is arranged in themes for the nine-year period of primary 1 to 6 and junior secondary school years 1 to 3. By the completion of junior secondary school, a Nigerian student is expected to be proficient in number and numeration, basic (mathematics) operations, measurement, algebraic processes, elementary geometry and mensuration, and everyday statistics. The new 9-year basic education mathematics curriculum has a three level structure namely: Lower Basic Education Curriculum (Primary 1-3), Middle Basic Education Curriculum (Primary 4-6) and Upper Basic Education Curriculum (JSS 1-3).

However, the revised National Mathematics Curriculum for basic education programme in Nigeria has the following objectives:

1) To acquire mathematical literacy necessary to function in an information age.

2) To cultivate the understanding and application of mathematics skills and concepts necessary to thrive in the ever changing technological world.

3) To develop the essential element of problem solving, communication, reasoning and connection within the study of mathematics.

4) To understand the major ideas of mathematics bearing in mind that the world has changed and is still changing (NERDC, 2007).

## 6. Discussions and Recommendations

Reform efforts in the Nigerian education system since attainment of independence in 1960 have been geared towards enhancing the quality of education from kindergarten to university in all content areas. The innovation in the 9-year basic education mathematics curriculum is an integral part of this larger scale reform agenda. From 1960 to date reform in mathematics education particularly at the school level has been promoting quality in curriculum content, pedagogy and assessment orientations.

Five major factors necessitated the review of the old primary and junior secondary schools mathematics curricula: meeting the needs of the Universal Basic Education Programme (UBEP), promoting the ideal of NEEDS, EFA and MDGs, the need to produce better informed, ICT complaint, bilingual citizens of high ethical standard, dissatisfaction with the previous curricula, and keeping pace with the emergent global and national issues. Nigeria's goal of eradicating illiteracy catalyzed her efforts to meet the ideal of the MDGs by 2015 and the critical target of the UBEP. It is believed that with the successful implementation of the new 9-year basic education (mathematics) curriculum and universal basic education programme, Nigeria will surmount the mountain of illiteracy and be counted among the educationally developed countries of the world.

The need to produce better informed, ICT compliant and globally competitive bilingual citizens of high ethical standard requires that quality education in the area of ICT, core national values and civic responsibilities be provided and curriculum remains the only tool to achieving this. In this regard the new 9-year basic education mathematics curriculum is interspersed with appropriate knowledge, skills, values, and experiences needed to produce educated and globally competitive self-reliant citizens.

The new 9-year basic education mathematics curriculum is also concerned with overcoming problems inherent in the previous curricula. These problems fit into the content, pedagogy and assessment orientations of the curricula. In the new 9-year basic education mathematics curriculum, doing mathematics is perceived as a thinking process and in addition to test and examination, students' learning is assessed through projects and group works in a constructivist learning environment that promotes the development of generic skills. Additionally, traditional methods of instruction gave way to activity- based, minds-on, hands-on student-centred strategies that enhance active learning. In this way, students are expected to have a more in-depth conceptual understanding of mathematical relationships and procedures.

Furthermore, content in the new 9-year basic education mathematics curriculum is organized in themes based on how learners learn and every topic in the curriculum is associated with quantitative reasoning tasks to enhance the development of problem solving and psychomotor skills. This is rather a departure from the academic nature of the old mathematics curricula which made it to loose touch of basic learning for life long survival.

One other positive development in the new 9-year basic education mathematics curriculum is that it keeps pace with the emergent global and national issues. Without being overloaded, emergent issues are well integrated into the content of the new 9-year basic education mathematics curriculum. Since knowledge is not static, old ideas which are becoming moribund are replaced with new ones.

The new 9-year basic education mathematics curriculum has been implemented nationwide since September 2008. The transition from the previous curricula to the new one through gradual and phased implementation strategy has been challenging for the programme because the teachers to implement the curriculum need to be equipped with appropriate knowledge, skills and experiences to motivate students to ask questions, engaging them in critical thinking, and using mathematical inquiry to foster best practices in the mathematics classrooms.

Most curriculum fail at the implementation stage when teachers are not adequately prepared to take up the challenges in the new curriculum. However, revising the curriculum is only necessary but not sufficient to reach the desired level of increasing the quality of the products of 9-year basic education mathematics curriculum to international standards. For the 9-year basic education mathematics curriculum to succeed, yield the desired results and meet the collective aspirations of Nigeria of the twenty-first century, all hands must be on deck to fully implement it since no curriculum can succeed without the teacher, teaching pedagogy, students' willingness to learn and conducive learning environment. Critical stakeholders in the Nigerian education industry have the onerous task of monitoring and continuously evaluating the curriculum and its products to explore the curriculum strengths and weaknesses.

The changes in the new curriculum contents and the mode of delivery in the classrooms will no doubt prompt vigorous studies among educators and researchers, but the only certain cause of intense research in school mathematics is a report of students' achievement test scores. In the past, students' performance in mathematics in both school and public examinations had been low and failure rates distressingly high thereby supporting the conclusion that school achievement in mathematics was far below the societal standard. The success of the new 9-year basic education mathematics curriculum in Nigeria will be judged in part with the performance of students in both internal and external examinations. The nationwide retraining of primary and junior secondary schools teachers in core subjects such as mathematics, English language, basic science etc embarked upon by the National Teachers Institute since 2006 in order to improve the quality of instructional delivery at that levels should be sustained and improve upon as there are obvious indications that in-service elementary teachers still follow the traditional methods of instruction and lack the mathematical competence expected as pre-requisite of effective teaching. The retraining exercise should in addition to

developing the cognitive skills and pedagogical practices of teachers sensitize them on the philosophy of the new 9-year basic education (mathematics) curriculum as observations reveal low level of sensitization among the teachers and this may lead to poor reception of the new curriculum. More importantly, teacher education programme for pre-service primary and junior secondary schools teachers should contain course(s) infused with the philosophy of the new 9-year basic education (mathematics) curriculum.

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## Author

**Adeneye O. A. Awofala,** Department of Science and Technology Education, University of Lagos, Lagos, Nigeria, e-mail: awofalaaoa@yahoo.co.uk.