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Issues and Challenges in School Mathematics Curriculum Reforms and Implementation for Peace and National Security

By

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Abstract

The world's hope for the future rests with today's young people and their readiness to take the challenges of the coming century on the threshold of the twenty- first century with the emergence of insurgency, communal clashes and incessant killing of innocent people all over Nigeria. The education of the young has never been more in need of commitment and resources. The importance of mathematic in today's word and the need to continually improve mathematics education to meet the challenge of the changing world is unquestionable. Providing all students with opportunity and the support to learn significant mathematics with in-depth and understanding is link to the value of a socially, just and democratic system, more tolerant and more peaceful society. This paper therefore discusses the issues and challenges in school mathematics curriculum reforms and implementation for peace and national security in Nigeria. The paper examines further, the concern for quality and relevance in school mathematics. The paper in its conclusion, propounds vision for school mathematics in Nigerian classroom settings in *order to abate crime and insecurity in Nigeria society.*

It was man's quest to solve his domestic and economic problems such as buying and selling that brought about the invention of mathematic. Since then, mathematics has entered into every sphere of human activity. Thus, the present level of civilization as presented in Onah (2010) is a product of man's creative ability to develop his potentials in taping the natural resources through development technology leading to transformation of nation's economy which the role of mathematic in this process is undisputable.

School mathematics curriculum as an instrument of national development and a means of empowering individuals to cope with the challenge of modern living

(Maduewesi, Aboho & Okwuedel, 2010) should be relevant to the needs of the society for an education which not only trains high level manpower, but contributes to the overall development of the nation. In line with Maduewesi**, Aboho & Okwuedel** (2010), the ministry of public education in Mexico in the documents "Foundation of the curriculum for the reform of the lower secondary education" states that mathematics is useful to cope with fractions, to plot functions, to calculate angles, probabilities and perimeters, and also to encourage abstraction in order to facilitate reasoning, develop the argumentation and introduction to the proof (secretaria de education public 2006;9) as translated. Thus the official justification for teaching mathematics is to provide students with mathematical understanding and the understanding is relevant to the society in general. Similarly, in line with the above document, Nigeria educational programs have metamorphosed in many ways. Such as introduction of 6–3–3–4 system of education in 1986 which aimed at producing high level technologist and scientist; introduction of Universal Basic Education (UBE) in 999 with the aim that by the end of nine years of continuous education, every child that passes through the system should acquire appropriate level of literacy, numeracy, communication, manipulative and life skills and be employable, useful to himself and the society at large (FRN, 2015). Despite these, the country is poorer than it was at independence in 1960.

Reformation in School Mathematics Curricula.

Reformation in school mathematics curricula goes along side with the reforms in Nigeria education system. Reform in education, would mean attempting to evolve a system of education that will respond positively to the needs and demands of the changing nature of the society. The reform may be focused on the content of the curriculum, the input structure and or the process.

To Ada (2013), reform is a planned effort to change for better, arising from perceived problems. Talking about reform in school mathematics curricular therefore, would mean attempting to evolve a system of mathematics knowledge that will respond positively to the needs and demands of changing nature of the society. The growth of knowledge and techniques required for the Industry, science, commerce, medicine and technology continues. All the future needs cannot be given or satisfied today but a solid foundation can be laid in readiness for the demands of these disciplines. To conform with these growing social needs, mathematics has been scrutinized and found to need changes. Thus, the so-called traditional mathematics (Arithmetical process) becomes grossly inadequate to cope with the modern needs, which gave room for the introduction of modern mathematics.

In the half of the 20^{th} century, curriculum development emphasized shop - and – yard skills prompted by the idea of functionalism (education you can see), some educators focused on identifying minimal competencies needed to perform different jobs; dollars – and – naira mathematics for clerking, feet – and – inches mathematics for carpentry, measuring cup - and- spoons mathematics for cooks and homemakers

(Lambdine & Lester, 2010). However, the changing needs of a changing world have made this restrictive view not only obsolete but also dangerous. The student who knows no more than shop - and - yard mathematics risks being left behind in a job market that increasingly emphasizes technology and information systems; risks being left out of the national and international discourses about economics, politics, sciences and health care; risks in short, the handicap of mathematical literacy.

The new 9–3–4 system of education in Nigeria which aims at reinforcing the extant 6-3-3-4 system of education introduced in 1983, consist of the first nine years of basic and compulsory education up to the **Jss**3 levels, three years in the senior secondary school and four years in the tertiary institutions. Its first 9- years duration which is popularly known as Universal Basic Education was designed to meet the millennium development Goals (MDGS) and Education for All (EFA) by 2015 (FRN, 2015).

The objective of the 9- year basic education curriculum which was approved by the National Council of Education (NCE)in December 2005 are that every learner who has gone through it should have acquired appropriate levels of literacy, numeracy, manipulative, communicative and life skills as well as the ethical, moral and civic values required for laying a solid foundation for life – long learning as a basis for scientific and reflective thinking. In line with the objectives, the 9 year Basic Education curricula were developed by the Nigeria Educational Research and Development Council (NERDC) for the primary and junior secondary education levels. The new curriculum has been approved by the federal government and reviewed to meet the needs of the pupils and students, respectively.

Issues in School Mathematics Curriculum

Issues surrounding the Nigeria mathematics curriculum include whether it was drawn as an integrated or broad based curriculum or whether it was hinged on job or occupational analysis. In whichever way, Abdu (2005) views functional mathematics curriculum as a wholesome training of an individual that makes him or her useful to himself, the community and the nation as a whole.

Okpala (2011) notes that the principal aim of education has been the development of the individual by presenting information which forms a response to the rapidly globalizing world by raising awareness of the environment amongst other things. The idea of Okpala (2011) was hinged on the 1994 goals for the year 2000 by America education act which challenges schools both to achieve and to compete as follows.

By the year 2000, United States students will be first in the world of mathematics and science achievement. The objectives for this goal are that;

i. Mathematics and science education including the Metric system of measurement, will be strengthened throughout the system, especially in the early grades.

ii. The number of teacher with a substantive background in mathematics and science including the metric system of measurement will increase by 50 percent and.

iii. The number of United State undergraduate and graduate students especially women and minorities, who complete degrees in mathematics, science and engineering will increase Significantly (education America act of 1994).

The society is dynamic and the mathematics curriculum should be the type that equips learners with the mathematical skills, attitudes and knowledge that will help them to function effectively and efficiently in the society. Therefore, the mathematics curriculum contents should be dynamic so as to keep pace with the trend of the society. This account for the reason why major reforms in school mathematics curriculum since independence in Nigeria is content-based reformation to meet the challenge of the society.

Implementation of School Mathematics Curriculum:

On the threshold of the twenty first century, education has emerged at the fore front of the world's concern over its own future. The challenges of the present 21st century to eliminate poverty and ensure sustainable development and lasting peace fall to today's young people. Educating the young to meet these challenges has become a priority objective for every society. Achieving this, hinged on the proper implementation of the designed or planned program. This enables one check for loopholes or hindrances which may cause such a program or plan not to achieve the expected results. The designing, of the school mathematics curriculum usually involves a pool of ideas, however, the process of implementing these ideas on ground has also been challenging. These challenges range from the teacher understanding of the curriculum design and how he should implement it. Among the myriads of the challenges are the following:

The danger of schools becoming mere training camps for passing examinations. The university- entrance- focused secondary school education has been the most stigmatizing problem in Nigeria. It has been the cause of almost all aberrant educational practices occurring in the schools. For example, as the main concern of all educational agencies is to prepare their students to obtain high scores to enter a prestigious university, no matter how sound a curriculum is developed, it has not been and cannot be implemented as intended. Private tutoring became a virtual school curriculum, a means for every student to use to win a competitive edge for entering universities and colleges.

Consequent upon the heated competition to enter universities, educational system in Nigeria focuses on academic education only which provides few learning opportunities outside formal school settings. Those who fail to advance to next level of schooling upon graduation, find little chance to pick up the opportunity at a later time.

Teaching and learning conditions also challenges the implementation of the school mathematics curriculum. Improved learning outcomes can hardly be expected by schools or of institutions generally if the conditions under which teaching and learning take place are not conducive.

The availability of mathematics teachers' textbooks and whether such textbooks are in compliance with the visions of the curriculum and reflects the learners' environment is another key challenge, National Council of Teachers of Mathematics (NCTM, 2009).The mathematics teacher therefore, struggles to translate the mathematics content to the learner in a manner that learning should not be too abstract but meaningful to the learner.

Concern for Quality and Relevance in School Mathematics Curriculum

Trends and development in earlier decades, both within and outside education, contributed to the upsurge of concern for educational quality at the beginning of the present decade. In the less developed regions of the world, the dramatic expansion of educational enrolments in the 1960s and 1970s severely strained the qualitative foundation of many if not most education systems. Pressures on teacher demand supply balances, pressures on educational management and administration, on the physical infrastructure of education and on the availability of instructional materials, leaves much to be done.

The difficulties faced by many countries in tackling these problems were compounded by the economic circumstances and budgetary constraints of the 1980s. Growing numbers of school leavers and higher education graduates entered adulthood ill-prepared for the difficult future that awaits them.

While progress is being made towards the goal of Education For All, renewed efforts are needed to ensure that the education provided is of high quality and relevant to social needs. In the words of Okotete (2012), this is essential if the young are to acquire the knowledge, skills, attitudes and values needed to lead active and productive lives in the knowledge – based societies of the future. More resources for education will be required not only to provide greater access to education but also to make that access meaningful.

Towards New Vision for School Mathematics in Nigeria.

The importance of knowing mathematics in the 21st century and the need to continually improve mathematics education to meet the challenges of a changing world cannot be over- emphasized. Understanding and using mathematics is described by NCTM (2000, 5) as an essential underpinning of life, a part of our cultural heritage and a prerequisite for success in the work place. Providing all students with opportunity and the support to learn significant mathematics with depth and understanding is linked to the values of a just democratic system and its economic needs.

The vision for school mathematics propounded by NCTM (2000) summarized as follows:

Imagine a classroom, a school or a school district where all students have access to high quality, engaging mathematics instruction. There are ambitious expectations for all, with accommodation for those who need it. Knowledgeable teachers have adequate resources to support their work and are continually growing as professionals. The curriculum is mathematically rich offering student's opportunities to learn important mathematical concepts and procedures with understanding. Technology is an essential component of the environment. Students confidently engage in complex mathematical tasks chosen carefully by teachers. They draw on knowledge from a wide variety of mathematical topics, sometimes, approaching the same problem from different mathematical perspectives or representing mathematics in different ways until they find methods that enable them to make progress. Teachers help students to make, refine and explore conjectures on the basis of evidence and use of a variety of reasoning and proof techniques to confirm or disprove those conjectures. Students are flexible and resourceful problem-solvers alone or in groups and with access to technology, they work productively and reflectively, with the skilled guidance of their teachers. Orally and in writing, students communicate their ideas and results effectively. Then they will value mathematics and engage actively in learning it. With the knowledge acquired, when applied will lead to a just democratic system, more tolerant and more peaceful society and by extension will reduce crime and insecurity in Nigeria.

Conclusion

Researches and experiences have shown that curriculum review all over the world depends on the nation and national settings. At the same time, it is a policy and a technical issue, a process, and a product, involving a wide range of institutions, actors with accompanying challenges. One positive note is that both government and the entire citizenry are seeking better ways of doing things using curriculum, that is, the anchorage of educational values, as a tool for achieving results that would benefit the country (Ibiwumi, 2011). The fact remains clear that for any educational system to adequately respond to the challenges of education for the sustainable peace and development of society, a potential, dynamic and living curriculum and careful implementation becomes very significant.

Recommendations

Restructuring mathematics curriculum to reflect areas of need such as habits of logical thinking, precision of taught and expression, sufficient knowledge of mathematical models of processes will certainly enhance; just democratic system, more tolerant and more peaceful society.

The role of the classroom teacher is to make sure that the students develop adequate self-confidence and good disposition to mathematics. The theoretical methods

of presenting the mathematical instructions to the learners should be de-emphasized to pave way for the practical methods of presenting the mathematical experience or ideas to the learners which will help them relate the idea acquired in the classroom to the productive sectors.

Periodically re-training of every mathematics teachers is necessary to keep them acquainted with the dynamic knowledge which will enable them transfer the same to their learners to help them cope with the challenges of innovation.

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