Research Article

# Mathematics as a tool for re-branding Nigeria: what, why and how in national development

Ezeugwu Justin O

Department of Science Education, University of Nigeria, Nsukka, NIGERIA.
**Email:** jugwujae@yahoo.com

## Abstract

**Introduction:** This paper focused on factors that make mathematics as a tool for re-branding Nigeria in national development. The paper discussed extensively such areas as: Historical perspective of mathematics during the olden period and during the period of colonization. The extensive application of arithmetics in the promotion of the business ventures of the colonial masters was indicated as a factor that helped in their ventures. The place of mathematics in the national policy of education as a core and compulsory subject indicating its importance in national development was pointed out. Other areas discussed include the importance of mathematics in the home, in science and technology, in Nigerians possible achievement of vision 20; 20: 20 and the indispensable use of mathematics in the achievement of all global goals of the United Nation's which Nigeria is a member were highlighted. Such goals are in MDGs objectives, the ICT goals and objectives, the EFA goals and Nigeria's vision 20: 20: 20. All of which mathematics serves as the only tool for achieving these national objectives, practically and empirically.
**Keywords:** re-branding, Nigeria.

**Address for Correspondence:**
Dr. Ezeugwu J. J. O, Department of Science Education, University of Nigeria, Nsukka, NIGERIA.
**Email:** jugwujae@yahoo.com
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## INTRODUCTION

Mathematics is a science of number and space. It is also a language of science and technology. Mathematics is very essential to almost every field of intellectual endeavour. It is recognized as the king queen and servant of all school subjects, since it cuts across the school curriculum. Mathematics has become so important that it occupies very core positions such that there is nothing in all human endeavours that does not require mathematical principles, knowledge and applications. Mathematics can be applied in Biology, physics, chemistry, architecture, Engineering, banking, law, medicine and indeed in any other subject areas thus, indicating its high degree of acceptability and utility. According to the 21st century chambers dictionary (revised edition) mathematics is defined as a science dealing with measurements, numbers, quantities and shapes, usually expressed as symbols. Viewed in another sense, mathematics is seen as a means of describing various phenomena, both in physical and economic situations using the concept of shapes, sizes, quantity and order. The national policy on education (FRN 2004) also placed a lot of emphasis on the need for basic knowledge and application of mathematics, science and technology, for purposeful and meaningful economic development of the nation since we are in the modern age of technological advancement. The national policy on education stimulates significant educational objectives in curriculum provisions for mathematics education at all levels of education in the country. At the primary and secondary education levels, mathematics education is made core and compulsory. The general objectives of mathematics education at primary and secondary levels of education are:

- Mathematics as a science of space and numbers should be taught to learners for use in explanation of the world of space and numbers
- Mathematics education should be used as a platform for teaching the extensive applicability

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of mathematics in various disciplines and in the world of work in general.

- School mathematics education should be such that it will help learners in the acquisition of skills of making generalizable statements based on practical and empirical evidences.
- Mathematics education should be planned systematically so as to generate and sustain interest and curiosity in learners, the future leaders of this nation.
- Mathematics education, in teaching and learning should emphasize transfer values and the wide applicability of mathematics in order to bring about positive mental attitudes in the learners.
- School mathematics education should also emphasize the appreciation of the elegance of mathematics in the natural environment and in the world of work.

These significant educational objectives of mathematics education as highlighted above and as in the policy statement can be said to be born from significant achievements of the white colonial missionaries colonization of this part of the African Countinent. Arithmentic was found indispensable achievements tool in the expansion of the colonial masters frontiers through commercial activities of the 3-R's of Reading, Writing and Arithmetic, were used extensively by the colonialist in then successful colonization of Nigeria in the 19th century. Their commercial activities, which turned out to be very successful, and which also contributed immensely to the expansion of their colonies was based on the 3 R'S, of which Arithmetic education and application by the colonized citizens helped most in the success of commercial ventures. In other word, Arithemtic applications in the commercial activities helped greatly in facilitating the colonalization strategies methodology of the colonial masters in the 19th century.

## METHODOLOGY

- Infact the indispensability of mathematics as a tool for re-branding the nation in terms of national development can be said to have started from the period of colonization in the 19th century. According to the Webster's Dictionary the term "re-brand" means: to make to look anew; to re-invigorate; tore-sharpen the focus of something; to keep making issues on something clearer, higher and always remembered; to ensured something has interesting out took, to ensure success always. Based on some criterion referenced indicators. The role of mathematics as a tool for re-branding Nigeria in terms of national development is therefore discussed in this paper under the following subheadings: The what, the why , and the How of mathematics as a tool for re-branding Nigeria in its role in the following national issues:
- History of mathematic and mathematic education
- Place of mathematic in national policy document
- Mathematics in every day activity of life.
- Mathematics in science and technology
- Mathematics in science and the Universe
- Mathematics in communication, market research, our planet and us, the weather, Doctors, prescriptions and medication
- Millenium Development goals
- Globalization bids of Nigeria- viz Information Communication Technology (ICT); Education For All (EFA) programme; giftedness of children programme, Nigerian's vision 20, 2020.

**Place of mathematics in the national policy on Education Document: what, why, how of mathematics as the re-brander of the nation.**

The national policy on education is a document prepared by the national education Research and Development Council (NRDC), A curriculum planning body in the country that is charged with conduction researches in education for the national for purposes of facilitating curriculum planning, curriculum development and curriculum implementation of all aspect of teaching and learning in education. In this respect, the body takes into consideration all the educational needs of the country and ensures that Nigeria's diverse cultural needs are reflected in the planning, development and implementation of the curriculum at all levels of education in the country. This national document in the first place, recognizes education "as an instrument per excellence for national development. It also takes the responsibility of placing subject areas needed in teaching and learning for national development in their order of priority at all levels of the education enterprise. The body recognizes some subject areas as core and compulsory, some as core and not compulsory and some as electives. Of these three categorizations, mathematics is placed as a core/compulsory subject in the national curriculum document. Core and compulsory subjects are those that are deep-rooted in all aspects of national development. Such subjects must be taught to the citizenry right from the primary level of education, all levels of basic education (lower, middle and upper basic) to senior secondary school levels. Such subjects include mathematics and English language.

**History of mathematics its importance and acceptability and wide spread world wide before the advent of colonialism in Nigeria.**

Mathematics has quite a history. It has its root in ancient Egypt and Babylonia from where mathematic spread rapidly to ancient Greece and India. Out of interest, Mathematics written in Greek, and in India were quickly translated into Arabic. Further translations of this mathematics to Latin gave birth to the mathematics of Western Europe. After a period of several hundreds of years, it metamorphosed to become the mathematics of the world, recognized internationally. China and Japan also developed significant and interesting mathematics that were included in the internationally accepted mathematics. Mathematics of other regions, like those of Nigeria- the Hausas, the Yorubas, the Ibos etc developed and used their own traditional counting systems effectively for their survival in many aspects of life- at home, in market place, in trading by barter etc. However, these other forms of mathematics did not have much influence on the current international mathematics on the basis that they were essentially traditional in out look and practice. However, the importance and indispensability of mathematics to nations world-wide continue to grow endlessly with new scientific invention.

**The what, why and how of mathematics as a re-brander in national development-mathematics in our everyday activities of life.**

Mathematics is applied in our everyday national or private activities. More than ninety percent of all the actions we take in order to live meaningfully as a nation and as individuals involve mathematical applications of one type or the other. For instance today, Nigeria as a nation is involved in all the goals and objectives of the united nations towards collective, competitive and comparative national development. Some of these goals are- the Millennium development goals (MDGs) and targets; the Education For All (EFA) goals and targets; the Information, Communications Technology (ICT) goals and targets; to mention but a few are criterion areas or targets or tools in which Nigeria wishes to use in order to be recognized, to show her mark, to indicate her own position amongst other nations in comparative terms, to indicate her belongingness etc, in the world of work in general. Two of the MDG goals and target are:

- Eradication of literacy in all member countries
- Eradication of extreme poverty among member countries etc.

**Two of the EFA goals are**

- Providing education for all citizens.
- Providing equal educational opportunities to all irrespective of sex.

**Two of the ICT goals and target are**

- Acquisition and utilization of all ICT facilities in teaching and learning
- Ensuring participation in making the world a global village etc.

**Two of Nigeria vision 20. 2020 goals and targets are**

- To ensure that Nigeria is amongst the first twenty nations in the world in terms of world ratings in the areas of economic and technological development by 2020.

Each and every one of these globalization efforts of the united nations, are only made practicable, feasible, realizable, achievable by any member county, and indeed in Nigeria with the application of mathematical principles and practices in the areas of planning the goals or objectives, in the areas of implementation and execution of the strategies especially in the areas of utilization of the resources made available and in the areas of evaluation of programme goals and targets, mathematical principles and practices become ready and indispensable tools. To this end mathematics becomes a re-brander of the nation in all these areas of national development. No achievement or head way is possible without adequate use of mathematics and its methods.

**Mathematics in science and Technology; The what, why and How of mathematics as a tool in national development.**

This is made clear in all aspects of science and technology. Mathematics is believed to be the mother of all sciences. All scientific inventions that make the world what it is today, have their foundations in mathematics. In the same vein, all technological inventions have their foundation in mathematics. Computer is a scientific invention that helps us perform a lot of things quicker than if they were done manually. Computer helps us a lot in other research endeavour - addition, multiplication, subtraction, and division of our raw data so that they become more meaningful and interpretable. In this way, one can take adequate decisions about our research endeavour and make useful inferences and conclusions in solving national problems. The information, communications technology (ICT) is a technology that utilizes the network of computers in solving a barage of problems for human race and in national development. Today, we can get to our homes and check our e-mail boxes; we can store all necessary information using computers; we can send or receive information across networks, we can down load information for use in other areas of interest, we can chart with colleagues in other countries with ease, we make use of mobile phones for easy and faster communication etc. All these scientific and technological inventions are rooted in mathematics. In other words, without mathematics, there will be no phone calls, no computer, no electricity, no vehicle for carrying people to and fro, no houses, no bridges, no good roads, no airplanes, no ship etc. Infact all these are

indicators of development of a nation. They are all rooted in mathematics. They have their birth rights in mathematics. The wide applicability of mathematic in all spheres of life makes mathematics the pivot of national development.

**The what, why and how of mathematics as a re-brander of national development in research generally, the planet and us, the weather, doctors prescriptions and medication**

All data collected during all forms of research-educational research, scientific research, market research, medical research, etc are made useful in national development through the application of mathematics and mathematical principles. In the same vein, human beings understand our natural world environment using such sciences as physics and biology. These scientific ideas are usually written in mathematical language for meaningful and measurable interpretations. The physicists, astronomers, use mathematical formulae in expressing the secrets of the universe and in sending human beings into space. Similarly, biologists teach that the secrets of life have a lot of bearings on the genes. The biologists use only the processes of mathematical application in determining how the genes are utilized in causing animals and plants to evolve and fit in their environments or habitants perfectly for continued existence and survival. Human beings have more sophisticated brains that make use of complicated interactions of the nervous system. Only mathematics has the chances or techniques or methodologies of describing the interactions of the nervous system. Even the way the patterns form on a leopard's coat displaying its natural beauty, yet the animal is dangerous, can best be understood using biological sciences which is interpretable based only on mathematical principles and applications. Weather trends affect our environment to a great deal. Climate changes may lead to more sunshine, more rainfall, more stormy weather and more flood. These are problem areas in national development. These problems are usually handled by environmental statisticians that apply mathematical techniques in predicting what could happen over the next several days, months or years for effective national planning and development. These are indicators of mathematics as a tool for re-branding the nation in all aspects of natural development. In the areas of medicine and Doctors, medical/prescriptions for various ailments, all these prescription must specify guidelines for dosages to be taken according to ages of patients and the nature of ailments. Doctors have to figureout millligrames of medication a patient needs by taking into consideration a lot of factors-age, weight, length of ailment etc before administration of drugs. The doctors also takes into consideration the length of time a patient should take the drugs before the ailment can be said to be cured. The drugs need to be converted from one unit of measurement to the other in accordance with some medical factors to facilitate cure. Some of the medications will be required to be taken by patient twice daily (morning and evening) some thrice daily, some once daily etc. doctors are able to perform all these functions of prescription adequately using mathematical principles applicable to medicine. In this way lives are saved and national development is sustained.

## CONCLUSION

Mathematics as a tool for re-branding Nigeria in the area of national development can be looked at from many ways- using the what, why and how of mathematics as a tool for re-branding national development in the following areas: from the home when an individual or group plans their budgets for self and societal development; from the market, where business takes place. National development is seriously anchored on the business sector because individuals and societies as well as the nation progress through such interactions. The paper also saw mathematics as a re-brander of national development using these plat forms:

- History of mathematics, during the dark ages and History of mathematics during the period of colonization in the 19$^{th}$ century. The utilization of arithmetic in promoting the colonialists ventures in the business sector, was highlighted.
- The place of mathematics in the national policy on education. In this policy document, mathematics is considered core/compulsory for all primary and secondary levels of education, thus indicating its importance in national development. In this document, education is regarded as an instrument par excellence in national development and mathematics is a core in educational teaching and learning in almost all disciplines.
- Mathematics in everyday activities of life- in this aspect, the extensive applicability of mathematics in other fields of human endeavour are x-rayed. In the areas of building and construction, in the market place, in planning, execution of plans of all programmes etc were fully discussed.
- Mathematics in science and technology. This aspect discussed the applicability of mathematics in all scientific and technological inventions-computers, information communication technology package, E-mails, chatting, communication, world wide, cell phones etc.
- The extensive utility of mathematics in all global programmes of which Nigeria is taking part-

were all fully highlighted such are (i) the millennium development goals which aims at reducing illiteracy levels amongst member state. Amongst others. These objectives of national development are possible with the application of mathematics.

- The information communication technology (ICT) which requires member nations to be a global village, has its root in mathematics principles and practices. This project is a very important aspect of national development and mathematics is playing this vital role for Nigeria's development
- Vision 20. 2020 talks about the vision of Nigeria to be amongst the first twenty nations word wide in economic and technological development. These visionary ideas are only realizable with the applications of mathematics in economic, scientific and technological ventures of Nigeria.
- Mathematics is indeed the life wire of Nigeria in all aspects of national development. It plays significant roles in re-branding the frontiers of national development.

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