

MATHEMATICS: A PIVOTAL REBRANDING TOOL FOR NATIONAL DEVELOPMENT

R.BadaAbubakar^{‡‡}
Federal College of Education(T),
Omoku, Rivers State,
NIGERIA.

S. A. DagogoWokoma
College of Arts & Science,
Port-Harcourt, Rivers State,
NIGERIA.

A. OlajumokeAfebuame
Federal Government College,
Port-Harcourt, Rivers State,
NIGERIA.

ABSTRACT

A strong brand is invaluable as the battle for it is high. Nigeria is a country that has been linked with corruption, high unemployment rates, underdevelopment among others. Rebranding Nigeria transforms it into a new brand making it a new haven and placing it side by side with developed nations of the world. O'Tudor (2009) reiterated that as a country, we need personal, corporate and institutional reformation to achieve a transformational repositioning of our national brand identity. Some developed countries like United State of America, USA, India, and Japan rebranded before reaching their status as world leaders today. The resounding presence of Mathematics is evident in all fields and human endeavor. This paper examines the pivotal role that Mathematics plays in all aspect restating it as a central tool for national development.

Keywords: mathematics education, pivotal tool, rebranding, national development

INTRODUCTION

In March 2009, rebranding Nigeria Project was launched with a slogan "Nigeria; Good People ,Great Nation". According to former Information minister, Prof. Dora Akunyili, "Nigeria cannot wait until it solves all her problems before it can start to give serious thought to rebranding it's battered image, this is because our development is tied to our image (Economic Confidential,2009).Every Nation seeks national development. Developed nations of the world started up as developing countries before they reached their present position as World leaders.

National development is the ability of a country to improve the social welfare of the people. It involves development of infrastructure such as roads, hospitals, airports, dams, schools, education, health, sports as well as development of its citizenry. National development encompasses economic development which is the increase in the standards of living of a Nation's population with sustained growth from a simple, low-income economy to a modern, high –income .So, economic development and growth implies a national development.

Mathematics is a branch of knowledge that deals with measurement, numbers and quantities. Mathematics is a tool, it'sknowledge and skills are the bedrock of all societal transformation and transfer of ideas into reality (Otunu-ogbisi, 2009).Each of the diverse branches of Mathematics has useful applications on which fields off human endeavor hangs. This pivotal position that Mathematics occupies makes it a tool for rebranding. This paper focuses on the position of Mathematics as a pivotal rebranding tool for National development.

REBRANDING NIGERIA FOR NATIONAL DEVELOPMENT

Rebranding is the creation of a new name, term, symbol, design or a combination of them for an established brand with the intention of developing a differential (new) position in the mind of stakeholders and competition (Wikipedia,2011).According to Daniel(2009),"Rebranding Nigeria simply means to redefine our concept of Nationhood and engage wholly in the process of National renewal to attain a height where National interest is exalted far above personal, ethno-religious and religious interest". These renewal changes are typically aimed at the repositioning of a brand, sometimes in an attempt to distance itself from certain negative connotations of the previous branding.

^{‡‡}badabubaka@yahoo.com

However, the main reason for a re-brand is to communicate a new message intentionally through a deliberate change in strategy from emergent situations. Firms have rebranded due to shed a negative image like Philip Morris, USA and AIG, or due to bankruptcy decided to rebrand as "The New GM" after selling Saab, Automobile and discontinued with Hummer, Pontiac and Saturn brands. Nigeria is currently termed a developing nation. Omale (2009) recalled that the closest Nigeria ever made to rebranding was when General Buhari and Idiagbon genuinely attempted to redirect the future of Nigeria through the Introduction of War against Indiscipline WAI. Nigeria's population is estimated at 158.2 million with an area of 923,768 sq km. Nigeria as a nation has been linked to 419 internet scams, corruption, voodoo, poverty and government corruption. It is campaigning for a new image and a new reputation in an effort to attract some much needed investment, developmental and economic growth in all facets of its hierarchical level. Stories about of inhumane and gory stories of treatment meted out to Nigeria and abroad just because they are "Nigerians". Aririesike (2009) opined that it is a herculean task marketing Nigeria brand in the international community. It is not a task that cannot be accomplished because Nigeria stands to gain tremendously from rebranding. However, O'Tudor (2009) cautioned that before rebranding Nigeria, we ought to perfect the internal process that constitute the brand DNA. He submitted that successful nations started with rebranding and now have brands associated with them for example, India has the education system regarded as the best in the world, Japanese, has global brands like Sony, Toyota & Nikon. Strength of these brands and the economic power they have delivered to their owners to be great World powers today.

Mathematics, Its Branches and Uses

Mathematics is an indispensable tool in all human endeavors. The richness of Mathematics is evident in each branch:

Mathematics Education

The practice of teaching and learning Mathematics along with problem solving techniques and issues relating to curriculum

Practical Mathematics

Arithmetic, elementary algebra, plane and solid geometry

Trigonometry

Covers measuring degrees, equations and formulae, essential to equip for trade or craft

Abstract and Mathematics concept

Involves set and functions

Euclidean Geometry

Number Theory: branch of pure Mathematics concerned with the properties of numbers in general and integers called higher Arithmetic

Geometry

Involves Mathematics concerned with questions of size, shapes, relative position of figures and with properties of space

Mechanics

Concerned with behavior of physical bodies when subjected to force or displacement and subsequent effect of the bodies on their environment

Heuristics and other problem solving strategies

To solve non-routine problems

Combinatorics

The Mathematics of counting

Probability

Mathematics of chance, quantification of our rational belief, Mathematics structures used to model pair wise relations between objects from a certain collection for studying shortest route path

Financial Mathematics

Application of Mathematics model to solve problems of finance

Mechanics

Mathematics concerned with behavior of physical when subjected to forces or displacement and subsequent effect of the bodies on their environment

Calculus

For problems which algebra alone cannot be sufficient, builds on algebra, trigonometry, analytic geometry and includes two major branches differential and integral calculus

Commercial Mathematics

Mathematics of accounts, Profit and loss

Graph Theory

Mathematics of connection in networks, study of graphs, Mathematics used

Mathematics as a Pivot Rebranding Tool

Nigeria needs rebranding for its economic growth. The usefulness of Mathematics in all fields that is needed for national growth and development is highlighted below:

Science and Technology

Mathematics is the foundation base of Science and Technology .Ugbebor(2009) professed that Mathematics is the language of Science and Technology hence prioritization of Mathematics teaching and learning in the bid for National development is inevitable. Mathematics is a basic requirement in all subjects' right from primary, secondary to tertiary levels. Mathematics is needed in integrated science right to Physics, Chemistry, Biology and engineering courses which leads to Technology .Countries like Japan, Taiwan, Singapore, South Korea, China and India are recognized due to their Science Technology and Innovation (STI) driven performance. Ibidapo-Obe (2011) resounded that scientific knowledge is fundamental to addressing the critical issues of economic transformation and globalization, reduction of unemployment, under poverty, hunger and disease and the sustainable use of natural resources facing the world today. Otunu-Ogbisi and Ukpebor (2009) also supported that Mathematics is an indispensable tool for the transformation of technological development to reality since technology development communicates the idea of growth expansion and improvement in goods and services emanating from practical application of science

Stock Exchange

Investors use a stockbroker to purchase securities from the stock exchange. Client asks for a quote from a stockbroker to make a purchase, stockbroker must calculate the purchase price which involves computing .The stockbroker must take the price/share of the stock at that minute and multiply it by the quantity that the client wants to purchase. Then the broker will add a commission fee to that total. The stockbroker will need to calculate this total rather quickly to give a client a quick and accurate estimate(Money eHow,2011).All these calculations involve the use of Mathematics .All calculations including ongoing management fee OER, which is stated as a percentage ,calculating leverage or comparing investment strategies and useful ratios of DPS,DY,EPS,PER,BV,PBV all involve use of Mathematics.

Banking Sector

Sanusi (2011) stated that "Banking system plays the important role of promoting economic growth and development through the process of financial intermediation and is the conduit for the implementation of monetary policy".Banks play the central role in development in every economy by mobilizing resources for productive investment. Transaction in banks is with money but money is

valued, counted and recorded using numbers .Bank transactions are recorded using Mathematics in stock bonds, asset base etc. Daily, monthly, quarterly transactions are prepared with applications from profit and loss, percentages and higher arithmetic. Banks recently consolidated with a capital base of N25billion naira, this is valuation using numbers, and this strengthened the banks. Banks in Nigeria reduced from 89 to 25, number of bank branches rose by 33percent from 3382 to 4500, total asset base rose by 104 percent from N3.21 trillion to N6.56 trillion, capital and reserves rose by 192 percent from N327 billion to N957billion, capital adequacy ratio rose by 42.6 percent from 15.18 percent to 21.6 percent (Nwansi, 2010).All these evaluation are expressed using Mathematics. Sanusi (2011) summed that a well repositioned bank is therefore expected to perform its role efficiently and contribute to development and growth of the economy.

Cryptography

Cryptography is the study of hiding information for creating codes for Automated Teller Machines ATM/Credit cards. ATM cards use pins that are numbers and this gives access to accounts wherever it may be. Since the inception of ATM card in Nigeria, banking transactions have been less stressful. With just 4-number pin code, transactions ranging from, banking, money transfer, utility payment like Power Holding Company of Nigeria PHCN ,Water rates, revenue ,tax payments can be effected, even payments like Cable Television payments and mobile phones recharge cards can be paid. Cryptography is indispensable to safety in modern communication (Ugbebor, 2010).She further stress that Number Theory thought to be an abstract area of Mathematics has in modern times turned out to be the basis of Cryptography. Ojugo, Oyemade, Orhionkpaio and Aghware(2010) resolved that Cryptography as the science and art of ciphers/codes that allows two users to exchange data in such a way that other users cannot understand through the use of data altering schemes such that only an intended recipient can undo and discover the original text sent by the sender.

Medicine

Mathematics is also a key to Medicine. Functional numeracy is an essential tool to an aspiring medical professional as functional literacy. Mathematics skill needed in medicine include basic mathematical knowledge sufficient to calculate drug doses ,concentrations ,an understanding of the core statistical concepts most commonly represented in the medical literature ,knowledge of Algebra to understand calculations of acid-base status ability to appreciate whether or not results are mathematically plausible(Nusabaum,2006) .Logical reasoning that is necessary for the study of Mathematics is an essential element of clinical reasoning .A medical practitioner need the ability to manipulate numbers ,including fractions, ratios ,powers of ten (10) and logarithms. Basic understanding of Probability, graphs and simple Algebra are all needed by medical practitioners. Developed countries have low prevalent rate of spread of diseases, this is calculated using percentages, using ratios and Probability.

Weather /Forecast

Weather forecast is the science of making predictions about general and specific weather phenomena for a given area based on observations of such weather related factors. In Meteorology, primitive equations are a version of the Navier -Stokes equations that describes hydro dynamical flow on the sphere. Thus, they are a good approximation of global atmospheric flow and are used in most atmospheric models. Synoptic forecasting is based and rooted with the QG-Omega equation, calculus, differential equations and partial differential equations are all essentials tools of a meteorologist. Weather forecasting helps us to make more informed daily decisions and help keeps us out of danger. Weather reports are expressed using numbers 300 C, 70 0C, -20 0 C, 500km below sea level etc. These forecasts prepare Countries for any eventualities, natural disaster like Tremor, earthquakes and its aftershocks, floods etc. This information make the country to gear up its emergency rescue teams like National emergency management agency NEMA, Fire service and rescue squad to be strengthened and stronger and even to put some gadgets and agency in place as prevention strategies.

Small and Medium Scale Enterprises SME's

Small and medium scale Enterprises have been credited with enormous contributions to the growth of any society. Entrepreneurial subsector of the Nigerian economy constitute majority of SMEs that employ fewer than five persons or none at all. Close to two-thirds employ fewer than twenty

workers. SMEs ranging from Artisans like Carpenters Mason, Plumbers, vulcanizeetc all use and basically rely on Mathematics in their job. Carpenters measures numbers, employing geometry to measures angles at which woods should be positioned for upholstery to take shape. Mason calculates number of bricks required for building, percentage of cement to be mixed with sand and quantity of water for building. Tailors take down measurements using numbers and from this make a quick calculation of how many yards of fabric is required to sew attire. Vulcanizers pump air into tyres and measure the Pressure standard International PSI to range between 40-45 depending on the automobile. Ikenga,Ogidan and Okpuzor(2010)reiterated that SMEs provide the avenue on which any county's economic growth and stability are formed .

Mathematics Education

Aziken(2009) identified Education as a tool for rebranding Nigerian Education . In contemporary education, mathematics education is the practice of teaching and learning mathematics, along with the associated scholarly research.

Researchers in Mathematics education are primarily concerned with the tools, methods and approaches that facilitate practice or the study of practice. The pedagogy of Mathematics has developed into an extensive field of study, with its own concepts, theories, methods, national and international organizations, conferences and literature. Mathematics is a central part of the curriculum from an early age right from primary to secondary to tertiary .It is a subject that should be passed at credit level at the secondary level and a minimum of a Pass level for tertiary admission. Mathematics Education can be used to rebrand through the use of varied method coupled with improvised instructional material, this lead to students aroused interest in the subject tantamount to improved academic performance. Innovation in research/teaching strategies .creation of Mathematics club in schools have tendency to remove the phobia for Mathematics. Professionalism in Mathematics Education and teaching to which developed countries belong abound. Mathematics is the only tool for membership into these National and International professional bodies. They include

Mathematical association of Nigeria (MAN)

Seeks to promote, encourage the development and effective use of Mathematics in Nigeria and to stimulate Mathematical thoughts, activities)

Nigeria Mathematical Society (NMS)

Seeks to promote Mathematics research and its application

National Council of Teachers of Mathematics (NCTM)

A public voice of mathematics education, supporting teachers to ensure equitable mathematics learning of the highest quality for all students through vision, leadership, professional development, and research, seeks to position the teaching and learning of Mathematics (www.nctm.org)

African Mathematics Millennium Science Initiative (AMMSI)

A network of Mathematics center in sub-Saharan Africa that organizes conferences & workshop, visiting lectureship and an extensive scholarship program for Mathematics graduate students doing Ph.D. work in the African continent.(www.ammsi.org)

International Mathematical Union (IMU)

Anon-governmental and nonprofit scientific organization devoted to promoting the development of Mathematics across the world

Mentoring African Research in Mathematics (MARM)

Supports Mathematics and it's teaching in Countries of sub Saharan Africa via a mentoring partnership between Mathematicians in the United Kingdom and African colleagues together with their students.(www.ims.ac.uk/grants/MARM.html)

International Commission on Mathematical Instruction (ICMI)

Founded in 1908,-forum to promote reflection, collaboration, exchange and dissemination of ideas and information on all aspects of the theory and practice of content Mathematics education from Primary to University level (www.mathunion.org/icmi/home)

International Commission for the History of Mathematics (ICHM)

Seeks to encourage the study of the history of Mathematics and to promote a high level of historically and Methods sophisticated in this field (www.unizar.es/ichm)

Sports-Sports is a strong unifying force in any Nation. In all sports, scores are recorded using numbers (2-1:football),(3-4,6-4,5-6:Tennis), (8 seconds :100 meters),1st, 2nd 3rd positions, etc. Mathematics is used to calculate goals aggregate in Football. In Olympics, most sports have players draw numbers to see who they will compete against. If there are 2 k contestants, then, all athletes participate in the 1st round of play, if not, and then some of the participants enter the 2nd round of play. The number of athletes entering during the 2nd round of play will be $2k - n$, where n is the number of contestants. Some sports uses geometry to calculate best angle of throw like basketball, cricket, and likelihood of a player winning can be obtained using probability, binomial. To get a basketball players performance, the number of shots actually made is divided by the number of attempted shots. e.g. if Tariah makes 9 out of 16 field goal attempts ,his 56% scores are also recorded using numbers. Golf needs the idea of vector to be able to project the trajectory at which the ball should travel for the ball to enter the cup. A goalkeeper relies on the properties of angles, algebra, surveys and chance data to know where to stand when defending the goals. All these tactics are what our National teams. League results are basically arithmetic e.g.

5	Points	Goals for	Attack strength	Goals against	Defense weakness
A	64	64	1.39	36	0.78
B	45	37	0.80	51	1.11
C	80	65	1.41	22	0.48
D	69	64	1.39	36	0.78

The average goals scored is 46.,if we divide number of goals by 46 ,we get a measure of the attack strength. For Team A, attack strength is $64/46 = 1.39$ this implies that they have 39 % more goals than average .Number of goals conceded is 36,we get a measure of defense weakness as $36/46 = 0.78$.Team B defense weakness is $51/46=1.11$ which shows they let in 11 % more goals than average(Spiegel halter&Ng,2009).All these are essential information that Mathematics can provide as winning strategies for our National teams to be top on list as developed nations.

Agriculture

Agriculture can be defined as the tradition, the art and/or the science –technology of culturing, multiplying, maturing and sustaining reproducibility of biological (plant, animal and aquatic) life for the ultimate purpose of providing nourishment support and sustenance of human life and existence on planet earth (Emekoma, 2010).Agriculture provides the Nation with food essential for the nutritional development of a Nation. The number of crops to be planted, amount of fertilizers to be used in ratio is estimated using numbers. The planting of root and tree crops involves knowing the dimensions and spacing between each crop and the number of crops andrequired plot it will take for its proper propagation is mathematically calculated. Knowing the quantity of chemical which will induce the hatching of eggs to fingerlings and the capacity of fingerling that each pond will contain depends on Mathematical knowledge (Otunu-Ogbisi &Ukpebor, 2010).Harvest are recorded using numbers. Rainy /dry season are predicted using Probability. Animal in animal farming are recorded using numbers, chicken feeds are measured using kilogram and ratio of chickens to the feed. Ratio is used to share tractors to agriculture rich states as well as fertilizers; this in all will improve National food security. Emekoma(2010) advocated that with adequate farm tractor, over 80% of direct human effort in the farming endeavor has been cared of and productivity of the individual farmer is increased over a hundred fold.

Economy

The argument is that for progress to occur in Nigeria, there has to be a lot of changes in the economic, social and political spheres (Nwansi,2010).Nigeria's economy is highly dependent on the earnings from the sale of crude oil which accounts for 77 % of government revenue and 95% of the country's foreign exchange earnings. The growth rate of real income per capital averaged uses % for calculation. Gross domestic product (GDP),a primary indicator to gauge the health of a country is obtained by dividing total Naira value of all goods and services produced over a specific time period .Information on GDP is an indication of a nation's health. If a negative or very low GDP is obtained from calculation, it is a sign of recession, while a high GDP implies a healthy economy. Crude oil on which Nigeria's bulk of income comes from is estimated in millions of barrels /day estimated at millions and billions worth of Naira. Decision making, budgetary allocations, fiscal policies and planning in every sector of the economy as well as equitable distribution of goods and services in different zones of the country as a whole depend on statistical parameters and inferences (Otunu-Ogbisi &Ukpebor, 2010).

Mass communication, Journalism and Print Media

Mass communication is a field that greatly relies on statistics. Students of Journalism and mass communication need Mathematics, Statistics, computer work, trigonometry, applied calculus. In print media, numbers are used for columns pages so as not to flush to another broadcast side. Newspaper companies uses the estimated population of Nigerians to project their daily production, the use of probability to predict sales,% profit and loss are also calculated on sales to deduce sales. Nigeria media scene is one of the most vibrant in Africa.

Everyday life activity

In everyday life, Mathematics is still central to the wellbeing of our day-to-day activities. We project to wake up using time, take account of budget for the day, how much the daily/weekly/monthly expenses will consume, this contribute to GDP of the nation. We consider how many people are our dependent, use ratios to share money to them according to age, need, size or priority. At school/work, we check our work load and project % of accomplishment that will give us satisfactory pass mark. We consider weather report that meteorologist have used Mathematics to deduce if we need to take umbrella, or it will be best to stay at home. We use computer that is founded on the principles of abacus and binary operation (0, 1), mobile phones are result from technology that Mathematics is it's foundation base to connect to our friends, family and business associates. At the end of the day, we assess the % of accomplishment for the day. Each of our daily activities centers on the use of Mathematics.

CONCLUSION AND RECOMMENDATION

Mathematics is an indispensable tool in all human endeavors and in any Nation especially in our Country Nigeria that aspire to be great world power. The central position that Mathematics plays in all field have been highlighted above from science and Technology, Stock Exchange, Banking sector, Cryptography, Medicine, Weather forecast, SMEs, Sports, Economy, Agriculture, Economy, Mathematics education, Mass communication &Print Media and in every day-to-day activities. The teaching of Mathematics should be done to help learner see, evaluate and appreciate the beauty and inherent universal usefulness in all Sphere of the economy. There is the need to keep learners firmly anchored on a set of human values; to teach young teachers how to process the vast variety of information so that they pick up Mathematical knowledge that are qualitative and functional to themselves and the society at large (Abubakar, 2010).Rebranding is a welcome development in Nigeria and it is the duty of Nigeria to rebrand Nigeria.

According to Isaw aElaigwu, a member of rebranding committee. We all can re-brand Nigeria ,once we continue to re-brand ourselves then Nigeria can be re-branded(Arriesike,2009).With Mathematics, rebranding ourselves ultimately rebrands Nigeria transforming Nigeria into a world rich economy. And we can ultimately claim'' Nigeria; Good People, Great Nation''

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