

## **The Teaching and Learning of Mathematics Concepts as a Tool in Secondary Schools for Self-Confidence and Re-Branding Process in Nigeria**

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**Abstract:** This paper examines the teaching and learning of mathematics concepts, problems and prospects or views of mathematics teaching and learning and equally looks at mathematics as a tool for self-confidence or reliance in solving our every day problems for the re-branding or changing process in the society. Therefore, mathematics teaching and learning is an interface between the teacher and the learners (students) that leads to attainment of desirable mathematical knowledge, ideas and skills required for applicability in everyday life in our Society.

**Keywords:** Mathematics teaching, Secondary school, Self-confidence, Re-branding process, Nigeria

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### **Introduction**

The society has become more and more under pinned by mathematical ideas. As a result, a major development in mathematics education in this era has been the increased amount of mathematics that all citizens are expected to know. Political leaders and Technological leaders need mathematics education that takes into account both the new uses of mathematics and technology and new ways in which mathematics can be done with information technology.

Ilori (1994) in his research hinted that societies and government around the globe (world) recognizes the significance of mathematics for national growth and development'. Wherever one belongs in a society, he/she utilizes knowledge of mathematics in one form or the other. Not to speak of an engineer, a businessman, an industrialist, a banker and a financier or a finance minister; a planner in a parastatal, commissions, departments, agencies, even unskilled laborers has to calculate his wages make purchases from the market and adjust the expenditure according to his income. Whosoever earns and spends uses mathematics. Counting, notation, multiplication, addition, division, subtraction, measuring, weighing, selling, buying and many more are simple and fundamental processes of mathematics which needs immense practice.

The concept of re-branding /change was announced by the Federal Government of Nigeria in 2008 and 2015 as a new way of attaining the vision 2020 which aimed at achieving sustainable human development in Nigeria? According to Muiyiwa (2009), the concept of re-branding includes internal conformation which is total change in all areas of our economy, including Nigeria's attitude. Oluniyi (2009) echoed that all the areas that need to be re-branded extremely is the education sector that always gets a little priority from various tiers of government, and called on the government to vote enough money for education if she wants to achieve greatness in 2020. Therefore, education should be re-branded, total change in the methodology through the use of modern techniques in teaching and learning, particularly mathematics education.

The knowledge and skills in these methods can be provided in an effective and systematic manner only by teaching mathematics in schools (Kulbi, 2006). Despite its value, mathematics has been one of the subjects which Nigerian students especially at secondary schools level develop dislike/hatred for and likewise perform poorly (Odili, 2006). The re-branding or change process in Nigeria which was propelled by late president Umaru Musa Yar'adua 2007, and President Muhammadu Buaru 2015 was directed towards positive perception of Nigeria at home and abroad. At the launching, the presidents described the "Re-brand /change Nigeria Campaign" as a re-awakening call on every Nigerian irrespective of tribe, political parties and religion. Re-branding Nigeria is a philosophical approach that can compel a change in the negative perception of Nigeria's image at home and abroad (Salisu, 2009). The big question that comes in is that, "what should be done to advance or improve the teaching and learning of mathematics being a tool for self-confidence in Nigerian Secondary School system in order to re-brand Nigeria as a Nation?. Kolawole and Oluwatayo (2004) stated that the more knowledge of mathematical concepts with the corresponding knowledge of their application to real life seems to be deteriorating.

Re-branding is an attitudinal change and repositioning of the mind for understanding of what should be, what is wrong, what should be corrected, what went wrong and what is the way forward. The course of re-branding was propagated in Nigeria by Late Professor Dora Akunyili, the former Director of NAFDAC for changing the image of this country (Nigeria) to other nations and for realization of developmental dreams. It means further improving the quality and quantity of the product for better appreciation and higher pricing which in turn lead to higher sales.

Ukonu (2010) stated that re-branding is changing the mind set or behavior of people, ethical transformation, being born again and throwing the past behind, charting a course for the future, reorienting our students for hard work and changing the dented image of mathematics for better performance. It is a process of influencing, appealing, communicating and consulting with a group for good.

For any nation (society) to develop technologically, scientifically, economically, politically depends on the manpower (human resources) the country has acquired. This man power includes the mathematics teachers, engineers, medical doctors, technologist and others. In order to produce future scientist and technologists in quality and quantity that are self-confident, the knowledge of mathematics is vital. However, students and people frequently ask these questions; How can the teaching and learning of mathematics be improved in our secondary schools as a tool for self-confidence? How significance is mathematics in attaining the Late President Yar'adua Re-branding campaign then? Therefore this paper examines the concept of mathematics teaching, problems or challenges and prospects of mathematics teaching and mathematics as a tool for self-confidence for re-branding the process in Nigeria as a Nation and the World at large.

According to Oxford Advanced Learners Dictionary (2001), self-confidence is seen as a person who is able to do or decide things by himself rather than depending on other people for help or assistance. The Oxford African Encyclopaedia for Schools and Colleges (1974) looks at self-confidence/reliance as a person that does not rely on any person; he performs independently to achieve his pre-determined goals. Therefore "confidence" is seen as an individual who is able to do, decide things and act independently to achieve his predetermined objectives. Oxford Advanced Learners Dictionary (2008) defines mathematics as the science of size and numbers which consists the branches such as arithmetic, algebra, trigonometry and geometry.

According to Odili (2006), mathematics is a body of knowledge, a collection of techniques and methods, and the product of human activity for solving problems. Mathematics is a major aspect of our educational system since its application cuts across all areas of human endeavor. For example, from social or economics viewpoint mathematics is a key element in our day-to-day living that every human being practices in one form or the other.

Makpa (2009) viewed teaching as an activity consisting of a body of actions intended to induce learning through the conscious and deliberate efforts of a matured and experienced person to impart knowledge, information, attitudes, skills, beliefs to an immature an inexperienced individuals. According to Ikegbunam (2009), learning is seen as relatively permanent change in behavior which reflects a gain in knowledge, understanding, or skilled achieved through experience which may include instruction, study, observation or practice. Both teaching and learning are geared towards the ability of the teacher to use his skills and materials to bring about desirable changes in students.

According to Kalu (1999), teaching is an activity which allows pupils or learners (students) to learn and acquire the described knowledge, skills and disposition required for becoming functional members of the society Bidwell (1993) viewed teaching as a series of interaction/interface between the teacher and the learners with the clear goal of changing one or more of the learner's cognitive or effective states. Hence, mathematics teaching can be seen as the interaction between the teacher and the learners to acquire the described mathematical knowledge, skills, ideas needed for becoming functional members of the society. He further stated that learning is the act of acquiring new or modifying and reinforcing existing knowledge, behavior, values, skills or preferences which leads to a potential change in synthesizing information, depth of the knowledge, attitude relative to the type and range of experience.

### **Problems and Views of Mathematics Teaching and Learning in Secondary Schools in Nigeria**

In spite the effort by the government on the development and provision of opportunities for the enhancement of mathematics teaching and learning in Nigeria secondary schools, there are still problems of mathematics teaching and learning. Some of these problems identified by Odili (2006) are as follows:

- ❖ Inadequate equipped mathematics laboratory for practical in the secondary schools.
- ❖ Teachers' impatience, inconsistency and un-preparedness.
- ❖ Poor policies by Government
- ❖ Poor emolument/remuneration for teachers.
- ❖ Inadequate curriculum integration.

- ❖ Lack of qualified mathematics teachers.
- ❖ Shortage of instructional materials/resources etc

Looking consciously at the various achievements recorded in mathematics education in Nigeria few years ago, there are more tasks or challenges ahead of mathematics teaching and learning. There have been efforts in mathematics curriculum development to correct these problems, but there seems to be more challenges in mathematics teaching and learning as summarized below:

- ❖ There is possibility of improving mathematics teacher's provision in the schools in the near future, with the establishment of more higher institutions and efforts of ministries of education
- ❖ With the knowledge of mathematics, sciences and technology and in particular the mathematics application to the development of the society is the Centre piece of Technicians, engineers, and scientists clubs and national competitions. To stimulate productivity, improvisation, interest in mathematics and technology and creative work in and out of school.

### **Mathematics as a Tool for Everyday Living (Existence)**

The significance of mathematics to everyday living cannot be over underscored. The mathematics curriculum in Nigerian secondary schools is designed and structured around four main concepts which include: Algebraic processes, Number and Numeration, Mensuration and Geometry, and everyday statistics (Kolawole and Oluwatayo, 2004). These concepts have direct bearing on people's way of life. Taking the concept of commercial arithmetic under numbers and numerations, several life skills that can be taught ranges from how to prepare "ready reckoners" for some groceries at shops, how to budget wisely and be able to live within one's means. It helps both wives and businessmen and women to do their business efficiently. It also helps to describe the population of a country, a state, a Local Government Area, a town or a family. The concept of length helps one to determine the size of his/her shoes, shirts, pieces of cloth required to sew a garment, determine the distance between two towns or villages. The knowledge of weight helps to determine the number of kilogramme of meat required to prepare a delicious soup for a household/family.

The concept of time can be understood by the use of clock; the time to wake up is indicated by the use of the clock. It is the clock that indicates the time to wake up in the morning, prepare for school, have rest, have specific lessons, time to complete studies, get married, retire from the public or private service, etc. These help to plan and make life worth living.

The concept of ratio and proportion has wide range of applications in chemistry, especially in the balancing of chemical equations and mass-volume relationships. Furthermore, the application of ratio and proportion had been recognized in taxation, income tax computations, import and export duties, exercise and local duties and insurance. The use of chemical for either weed or pest control require a sound knowledge of ratio in mixing the chemical. Similarly a mason requires the knowledge of ratio and proportion for mixing of concrete.

The problems involving inequalities frequently occur in industry and in ordinary life. Many of these problems can be solved graphically and solutions reached. For small and large business to thrive it must minimize cost and maximize profit and this requires the use of linear programming.

Re-branding or changing the transport industry/sector requires developing the transport system to match the intended modernization. This will result in development and effective use of the railways, airways, waterways and roads for transportation of goods from one place to another within the country. In this case, a lot of mathematics is used directly and indirectly in developing these networks of transportation. The marking and construction of play fields, courts and pitches for athletic track, football, hockey, basket ball, long jump and others, require the knowledge of geometry such as Pythagoras theorem, constructions, measurement of angles etc.

The knowledge of geometry is a mathematical model of shape, size patterns and motion in two and three dimensions (Kolawole and Oluwatayo, 2004). For instance, in measuring both local and global distances, the knowledge of geometry is very essential.

In buying a rug/carpet for the home, even in estimating the number of cement blocks required to build a house, we cannot do without geometry. The mason or building engineer requires the knowledge of geometry for setting of foundations and its constructions. An individual can be re-branded with the use of mathematical concepts to cut, cost, save time and maximize profit without compromising standard or quality. The concept of variation, (direct, indirect, joint and partial variations) had been found vary useful tools in economics, sciences, technology, industries and others. Direct variation can be useful to tailors, the more the time he spends on a design the more amount of money he charges the owner of the cloth. Similarly, indirect variation is a useful tool for teaching population education. For example, the larger the population of a family, the less attention or care is given to members. Partial variation is also used to determine the total cost of electricity bill in a house. The Power Holding Company of Nigeria (PHCN) uses the concept of partial variation to work out the PHCN bills

per month. The cost of servicing meter is usually constant or fixed while the cost per unit of electricity consumed during a month depends on usage of the electricity for the month, which varies. Statistics, deals with collection, organization and interpretation of information or data based on the number of things. It makes possible, advances in science and technology as well as supplying framework for improved decision making in management and public affairs. It is very important for educational planning and budgeting, statistics helps us to know the pupil -teacher ratio, number of drop outs, enrolment ratio and prediction of out- come of educational programmes. Governments use statistics to know the population of a country, state/ local government area for sharing of amenities, managing resources and budget planning.

The application of probability in re-branding or changing the Nigeria citizenry for self-confidence/reliance is very significant. Ability to foresee the result of an election or the possibility of winning a football match. It is used for forecasting weather based in previous events. The applications of mathematics for everyday living are many and cannot be drained. When these applications are used in the process of teaching and learning, it helps to make the students (learners) better and therefore a better citizen in the society.

Mathematics is a subject that helps students to form the habit of transparency (clarity), brevity, accuracy, precision and certainty in expression or communication and this will go along way in giving us the much needed unity in this country (Odilli, 2006). In preparing students for life, we may consider the power of mathematics in character building. It also demands hard work from the learner, which is what is much needed in our society today in line with the re-branding agenda.

### **Conclusion**

This paper so far, has examined the concept of mathematics teaching and learning as a tool in secondary schools for re-branding process in Nigeria. To say that mathematics has no link with re-branding process is unthinkable, because of its roles in human endeavor.

Teaching and learning of mathematics for life skills and self-confidence/ reliance implies making the learners see mathematics beyond the classroom boundaries. It means that learners (students) must be brought to the real world of issues and relate the mathematics they learned to the realities of life. The essence of teaching and learning mathematics for self-confidence is to promote responsible or reliable citizens as a sure way in the re-branding or changing process.

### **Recommendations**

The following recommendations which are based on the study have been advanced. The researcher recommends that:

- ❖ Adequate instructional materials/resources and mathematics laboratory equipment should be provided for effective teaching and learning of mathematics in Nigeria secondary schools and beyond.
- ❖ Mathematics teachers should always endeavor to relate mathematics models to real life situations.
- ❖ Mathematics curriculum developers or planners should make sure that, there is accurate integration of the curriculum in Nigerian secondary schools.
- ❖ More qualified mathematics teachers with certificates in education should be employed by Government to teach the subject in secondary schools.

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