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Mathematics as a Foundation for Children Education in Science and Technology

[1]F.I. Olusi and [2]Anolu Easter
[1]Institute of Education, Ambrose Alli University, Ekpoma, Nigeria
[2]Department of Curriculum and Instruction Faculty of Education,
Ambrose Alli University, Ekpoma, Nigeria

Abtsract: This study attempt the explaination of the concept mathematics from various philosophical views, with the aim of helping the classroom teacher applies appropriate teaching methods. The study identifies the various types of learner the classroom teacher is exposed to with the view of understanding them to avoid a mismatch of teaching method and learner type. The study further identifies teaching methods appropriate in the teaching primary mathematics. Conclusively, the authors reiterate the importance of understanding the subject matter vie the philosophy guiding it, learner type and teaching method to enhance appreciation of the mathematics as a foundation for primary science and technology.

Key words: Mathematics, children education, science and technology

INTRODUCTION

Understanding the concept of mathematics: Mathematics may be conceived as an object science which is independent of any, except the most rudimentary philosophical assumptions. It is a body of proposition dealing with a certain subject matter and these propositions are true insofar as they correspond with the facts. This is the formalist view which may be called empirical formalism. To the formalist the central concept in mathematics is conventions which must be learnt.

In the study of formal system we do not confine ourselves to the derivations of elementary propositions step by step, rather the system is taken defined by its frame as datum and studied it by any means at our hand. Mathematics therefore can be thus summarised as the science of formal system.

Other view on what is mathematics is Russell (1919) who observed that the concept of mathematics can be explained through explicit definitions and through logical axiom through pure logic deductions. He explained that in proposition calculus for example which deal with the relation s between unanalyzed sentences the most important concept are the negation of a sentence the concept of functional calculus are universality and existence (x) + (x) reads for every x of x means that the property of f belong to every object, this basical foundation goes along way to help disabuse the abstractness of mathematics. Mathematical object however stands in certain relation to one another independent of the learner. What the learner, therefore does is to discover these objects and their relationship. This is what is expected of the classroom teacher, showing the learner the relation between these bodies. The knowledge of mathematics helps the individual to think clearly and reason logically as it helps the learner to develop computational skills.

LINK BETWEEN MATHEMATICS AND SCIENCE

The link between mathematics and science can be seen from the importance of mathematics. Mathematics is widely refereed to as science of numbers, shapes and the language of science of technology as a means of communication without communication probably the world would have been at a stand still. According to, Ujeje (1992) without mathematics there is no science and without science there's no industrial development.

Supporting this view Harbour-Peters (2001) have this to say mathematics remain the pivot upon which any true science resolves. This is because the understanding of mathematics excerts great influence in the understanding of all deductions in science subjects. The importance of mathematics is underscore by the following facts; the every day use of arithmetic and the display of information by means of graphs is an everyday common place.

These are the elementary aspect of mathematics. Advanced mathematics is widely used often in an unseen and unadvertised way. The mathematics of error-connecting codes is applied to CD player and to computers, the stunning pictures of far away planets sent by voyager II could not have had their crispness and

Corresponding Author: F.I. Olusi, Institute of Education, Ambrose Alli University, Ekpoma, Nigeria

quality without such mathematics. When ever it is said that advances are made with supercomputers, there has to be a mathematical theory which instruct the computer what is to be done, so allowing it to apply for speed and accuracy. Voyager journeying to the other planets could not have been calculated without the mathematics of differential equation.

Mathematicians initiate the development of computers and logicians who continue to make important contributions to the theory of computers science. In ecology mathematics is used for the study of population change. Statistics is essential in medicine, for analyzing data on the cause of illness and on the utility of new drugs. Body scanners are expression of subtle mathematics discovered in 19th century, which makes it possible to construction image of an inside of an object from information on a number of x-ray view of it. Mathematics makes an especial contribution to the study of these ideals, namely the methods of; precise definition, careful and rigorous argument; presentation of ideals by many methods, including symbols and formulae, pictures and graph; it's a means of calculation and the obtaining of precise solution to clearly stated problems or clear statement of the limit of knowledge. Therefore, for all these reasons Nigeria to compete favourably with developed nation of the world in technology and industrial development there is the need to develop in her citizenry mathematical art right from the primary school being the foundation of learning.

The teaching of mathematics at the primary school should be to teach procedures and not solutions as its now been done. This is in consonant with the gestalt psychological view which maintains that there are in the learner basic perceptural structure and schemes of behaviour which constitute some kind of basic unity. It underlines therefore, the presence of an innate institution in the learner and it prescribes intuitive methods based on perception.

Understanding the learner: According to, Pask in Ihumuavbi and Olusi (2002) there are different type of learners the classroom teacher is exposed to, these include the followings Sensing/intuitive learner, Visual/verbal learner inductive/deductive learner Active/reflective learner and Sequential/global leaner.

Sensing/intuitive learner: This type of learner favour information that comes through their senses, they like facts, observation and prefers to solve problem using well established procedures. They may be slow, but are careful. Sensor learners are less comfortable with symbols as they must translate them into concrete mental images in order to understand them. This process can be a lengthy one and many sensor that knows the materials typically run out of time on test or examination. The end result is that they tend to get lower grades in their courses. Intuitive learners on the other hand favour information that arises internally through memory reflection and imagination hence they are quick but may be careless.

Visual\verbal learners: Visual learners understand better when usual images are provided to support the information that is being share. These groups do not retain information shared using the lecture method where information is simply related and not shown. The primary school mathematics teacher should provide images to facilitate the grasp of the topic of study at all times.

Inductive\deductive learners: Inductive learners prefer to learn a body of materials by seeing specific cases examples and working up to governing principles and theories by information. Inductive learners promote deeper meaning and longer retention of information and gives student greater confidence in their problem solving abilities. The deductive learner on the other hand tends to be more concise and orderly.

Active\reflective learners: Active learner's t ends to learn by doing some things. They work well in group learning from others of their mates, while the reflective learners prefer to work alone.

Sequential and global learner: Sequential learner absorbs information and acquired information in small connected chunks while global learners take n information in seemingly unconnected fragment and achieve understanding in large holistic leaps.

IMPLICATIONS OF TYPE OF LEARNERS TO THE CLASSROOM TEACHER

The primary school mathematics teacher should understand the various types of learner this will enable him employ different methods of teaching that will enhance effective learning. According to, Feldar (1984), the mathematics between the teaching style and learning styles of most of the learners have serious consequences as learner who experienced it tend to get lower grades than learner whose learning are better matched of the teachers teaching style. The teacher should understand that corresponding to each domain of learning there are valid and appropriate method and that the effectiveness of learning will depend upon an ever-vigilant discovery of more and more appropriate method in each domain of learning.

It is clear for example that while English can be learnt by discussion many topics in mathematics at the primary level cannot and should not be taught by discussion Unfortunately teachers tend to favour their own instinctively styles in part because they instinctively teach the way they were taught in most colleges. This unbalance put a sizable fraction of the learner population at a disadvantage position and consequently leads to breakdown of interest. The importance of interest and zeal to carry on among other thing to learner's achievement is well spelt out in Olusi (2005). Interest of a subject can be damped by various factors which including teaching method, teacher qualification, socioeconomic background if the learner.

MATHEMATICAL TEACHING METHODS AT EARLY PRIMARY SCHOOL

There are various teaching method exposed to the teacher and the teacher who is worth of his onion should be able to device appropriate teaching methods that will suite his learners these include the followings.

Guided discovery\montessori\froebel approach, Games and play method, Computer assisted instruction, Programmed instruction and Demonstration method.

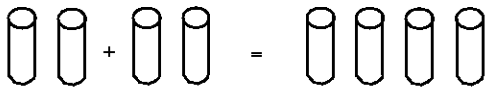
Guided discovery/montessori/froebel approach: The principle underlining this method believes that children should have a pleasant learning environment, where teaching materials and facilities are varied and adequate and that there is sufficient space. Children have to be led to discover for themselves and encouraged in their own play to learn. The teaching emphasis here is placed on the provision of materials, toys that encourage computational skill. This of course is under the guidance of experienced teacher.

GAMES AND PLAY AWAY METHOD

Play is important to everyone's life, particularly that of the child. All work without play makes jack a dull boy. This saying is truth to a large extent play is of course part of the basis for the child's first experience of life. It widens his horizons, enabling him to come into contact with other children and materials. Play contributes to the understanding of puzzles in mathematics.

Programmed instruction: This method encourages the presentation of the lesson study in phases/stages. The learner is only allowed to proceed to the next stage on the successful completion of any given stage. This method finds favour with sequential learners who do not like a whole lot of information at a given time. A good example of this method can be found in engineering mathematics by K.S Stroud.

Demonstration method: Children learn more by copying from others. Practice they say make perfect and example is better speech. The more the teacher demonstrates the action required in mathematics the better for the learners. For example 2 + 2 = 4 can better be taught by using symbols like



Question and answer method: The use of question as a teaching method has a number of advantages of course; the most immediate one to the teacher is that he himself can increase his own knowledge by this technique. More generally it should be realized that great discoveries and invention often originate from an unresolved question. This however, is appropriate at senior primary level.

CONCLUSION

Mathematics as a subject within the science and technology popularly call STM (science technology and mathematics) excert great influence in the understanding of science subjects owing to the fact it is described as a language of communication in science and technology. Therefore without mathematics there is no science and technology and without science and technology there is no industrial development. For the successful development of language of communication its better started at early age this is why the study of mathematics can not be left in the hand of quacks this is further coupled with the numerous advantages of it. The need to understand the learner is paramount to the successful teaching of mathematics. A qualified mathematics teacher should be able to understands his learners learning styles and the appropriate teaching method to achieve the objectives for any given mathematics lesson. This study has identified these variables for children to appreciate mathematics better.

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