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The Use of Mother Tongue in Communicating Mathematics: Implication for Teaching and Learning of Mathematics

Uwase Uwase Esuong
Department of Mathematics, College of Education, Afaha Nsit

Ofonime Friday Udo
Department of Mathematics, College of Education, Afaha Nsit

Item Asuquo Effiong
Department of Mathematics, College of Education, Afaha Nsit

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ABSTRACT: *Mathematics as a school subject is designed to solve the everyday problem created by human activities; these problems are domesticated in the different cultures of man all over the world. However, the performance of students keeps dwindling due to the westernize approach of teaching and learning mathematics. In other to solve this precarious situation this paper advocated the use of mother tongue in the teaching of mathematics. Mother tongue approach here refers to first-language education as a medium of instruction. The use of mother tongue in the teaching and learning of mathematics is meant to address the high functional illiteracy of Nigeria where language plays a significant factor. Using mother tongue to teach the basic concepts of numbers, operations and other concepts of mathematics helps build a strong foundation for the understanding and learning of higher mathematics. This approach is effective not only in getting the interest of students in the lesson but as a springboard in teaching new mathematical concepts, principles and in deepening student understanding on how mathematical operations or processes work. The mother tongue concepts of teaching and learning mathematics in this work shall be based on the following sub-topics: Numeration/Counting System, Basic Arithmetic Operations, Rhymes and Geometric Concepts. The paper completely reduced the Eurocentric mathematics beliefs of students and make them discover how best mathematics can be learning from their mother tongue. The paper recommended amongst others that teachers of mathematics should adopt the use of mother tongue in teaching mathematics in order to improve students understanding of the subject.*

KEYWORDS: mother tongue, teaching, learning, mathematics, school

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INTRODUCTION

Mathematics as a human activity is very relevant to everyday activities of man and manifests in all cultures the world over (Ekwueme, 2013). This is as it provides a powerful, concise, and unambiguous means of communication among people of either the same culture or different cultures (Esuong & Ibok, 2022). This is the reason Enukoha (1995) indicated that every society no matter the level of its development develops some type of Mathematics that helps its people to tackle their daily societal problems. That is, we find in every culture a way of counting, subtracting, and performing logical deductive reasoning that could be considered unique to that culture (D'Ambrosio, 2001).

Mathematical skills are often hard to acquire and master in a language unfamiliar to the learners. Oftentimes, students fail to master mathematical concepts and skills when they can hardly comprehend the medium of Instruction (Bockarie, 1993).According to Toquero, (2010) children understand mathematics better when they are taught using their mother tongue. Learning using mother tongue also helps to develop mathematical vocabularies that could be easily used and remembered by students.

In Nigeria, the medium of instruction for Mathematics is English, a language that serves as a second language for multilingual speakers. Nigeria learners then must grapple with several skills and to master two areas, the Mathematical skills and the English language at the same time. Johnstone (2011) revealed that grammar and reading comprehension are both primary activities that are possible determinants of success in acquiring mathematical skills. However, to master the basic mathematical skills, English proficiency is a must. One of the Basic Essence of this paper is to justify the introduction of mother tongue as a medium of instruction. Mother Tongue-Based Education (MTB) refers to *first-language first* education that is, schooling begins in the mother tongue then transitions to additional languages particularly English. It is meant to address the high functional illiteracy of Nigeria where language plays a significant factor. Nigeria appears to have poor performance in Mathematics because they are not well-versed with the English language which is the medium of instruction.

In Nigeria and indeed, Africa in general, mathematics which simply concerns calculation, measurement and shape is unwritten. Thus, it is culturally determined and transmitted orally from generation to generation (Zaslavsky, 1973). This mathematics which is culturally determined and locally transmitted in mother tongue are further reflected in practices especially in: counting, measuring, locating, designing, and playing (e.g. games). The use of mother tongue in this paper shall be focused on the Efik culture and language.

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The Efik Culture and Language

The Efik people are found in the south-south geopolitical zone of Nigeria whose predominate language of communication is known as "IKO EFIK". In the South Eastern corner of the Cross River State, they occupy the basins of the lower Cross River and down to the Bakassi peninsula, the Calabar River and down to its tributaries the Kwa River, Akpayafe (Akpa lkang) and the Eniong Greeks.

Although the actual, origins of the Efik people are unknown, oral traditions provide accounts of their migration from Igbo and Ibibio territory to the present location. The twelve original clans sojourned Ibom in Aro-Chukwu and later left this area finding residency in places Such as Enwang, Eniong, Ito, Ukwa and Eki who are these days neighbors to Umon, Agwagune and Aro-chukwu; However, those who kept themselves together in the area covering Uruan, Ikpaene, Creek town and Calabar later constituted themselves in "Essien Efik Itiaba (the seven Efik clans) excluding Enwang, Eniong, Ito, Ukwa and Eki who were later in 2011 reconstituted into the original twelve city-states by the incumbent Obong (His Eminence Edidem Ekpo Okon Abasi Otu V). The Efik of old Calabar were literate and enterprising. Partly because of the privilege to have had early contact with the European traders and partly because of their interaction with the Scotland Christian Missionaries, the likes of Mary Slessor, who abolished the killing of twins. Their interaction with the white made them embrace Western Education with the establishment of hope waddle-training institute Calabar in 1895. The Efik predominately speak the efik language as their first language otherwise known as mother tongue. This language is lightly different from the Ibibio and annang. The mother tongue concepts of teaching and learning mathematics in this work shall be based on the following sub-topics:

1) Numeration/Counting System
2) Basic Arithmetic Operations
3) Rhymes
4) Geometric Concepts.

Numeration/Counting System

Counting is carried out at three base levels which are:

(i) Base 5
(ii) Base 10
(iii) Base 15
(iv) Main base 20, 40, 60, 80 and100

There are special words for these base numbers:

10	=	Drop	Basic numbers are:	1	-	Kiet
15	=	Efid		2	-	Iba
20	=	Edip		3	-	Ita

40	=	Aba	4	-	Inan
60	=	Ata	5	-	Ition
80	=	Anang	6	-	Itiokiet
100	=	Ikie	7	-	Itiaba
			8	-	Itiaita
			9	-	Usukkiet

Every other number fall as a combination of the basic number, words and the sub-bases, for instance;

11	=	Duop-kiet
17	=	Efit-iba
30	=	Edip ye duop
50	=	Aba ye duop
200	=	Ikie Iba
1000	=	Thousin Kiet

Song: Ete John enyene Ndito duop… (Npri ndito)
Kiet, Iba, Ita, Inang, Ition… (Npri ndito)
Itiokiet, Itiaba, Itiaita, Usukiet, Duop.

We observe that the system of counting give rise to addition by expanding and combination of the main base, the basic base, and the sub-base. These have made feasible the formation of number words for numerals up to 1000 and even beyond.

Basic Arithmetic Operation

The following terms are given special names to aid mathematical calculation in the native Efik language;

Addition	-	+	-	ye
Multiplication	-	x	-	ke
Subtraction	-	-	-	sio
Division	-	÷	-	bahara

The use of the Efik mother tongue in teaching mathematics makes the use of the signs necessary for interpretation, for instance;

Use of + (Ye)

30	=	Edip ye duop	=	20 + 10
95	=	Anang ye Efid	=	80 + 15
150	=	Ikie-kiet ye Aba ye duop	=	100 + 40 + 10

Use of x (Ke)

30	=	Duop ke Itie Ita	=	10 x 3	=	30
4	=	Iba ke Itie Iba	=	2 x 2	=	4

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Use of - (Sio)

17 = 20 – 3 Edip sio ita = 17

Use of ÷ (Bahare)

Bahare is the native word for divide or share; for instance, if 3 oranges are to be shared among 2 people, we simply say;

Sokoro Ita bahare ye Iba i.e. 3 ÷ 2 or 3/2 this brings of the concept of fractions; they are no special words for fraction in the Efik kingdom except for half (½) called ubahk. Others are statements used to denote those fractions;

5/3 - Ition bahare ye ita,
9/7 - Usukiet bahare ye itiaba

Zero

The number word for zero is ikpu-ikpu meaning nothing. In the mother tongue arithmetic zero plays the role of an additive identity when added to any number doesn't change the form or value of the number. For instance; 0 + 2 = 2 i.e. ikpu-ikpu ye iba but in its unit form the word ikpu-ikpu is significant. For instance, 20 in unit form 2 ' 0
Iba ye Ikpu-ikpu

Rhythms

They are some songs in the mother tongue use to teach counting to children, although they were not written down some of which are:

Song 1: Ete john enyene ndito duop (Nkpri ndito)
Kiet, iba, ita, inang, ition (Nkpri ndito)
Itiokiet, itiaba, itiaita, usukiet, duop (Nkpri ndito)

Song 11: Isip itiaba do… wawaradi… kiet fo do… wawaradi
Iba fo do… wawaradi, ita fo do wawaradi,
Inang fo do wawaradi…
Ition fo do wawaradi…
Itiokiet do wawaradi 2x

Geometrical Shapes

There are some of the native drums, and tools used in the Efik kingdom that has mathematical implication and can be used while teaching in mother tongue. For examples;

(1) Obodom stick drum - Cylindrical shape
(2) Nkong Iron Drum - Cone shape
(3) Ikim mmong - Sphere
(4) Ekebe - Cube

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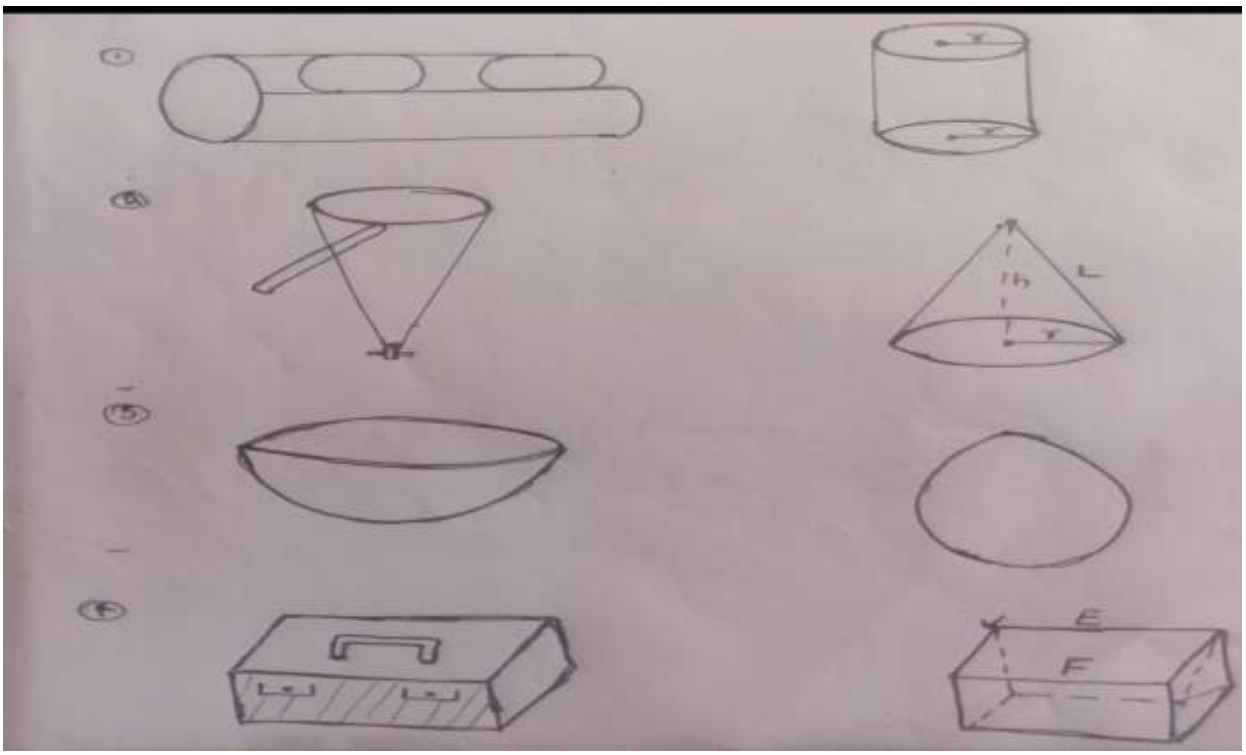

CONCLUSION

Using the mother tongue to teach the basic concepts of numbers and operations helps build a strong foundation for the understanding and learning of higher mathematics. This approach is effective not only in getting the interest of students in the lesson but as a springboard in teaching new mathematical concepts and principles and in deepening student understanding on how mathematical operations or processes work (Toquero,2010). Children who read and write in the mother tongue before learning another language not only are more successful second language learners but also excel more quickly than their peers who did not become literate in their first language (UNESCO, 2006). This forms the basis for their relevance in fostering positive learning in students and by extension, effective teaching of mathematics in classrooms. Culturally based teaching mathematics has shown to be a veritable option for adoption in classroom mathematics instruction (Abiam, 2006).

Recommendation/Implication for teaching and learning of Mathematics.

1. Teachers of mathematics should adopt the use of mother tongue approach in the teaching and learning of mathematics.
2. Government should provide the enabling environment for mother tongue teaching and learning of mathematics to strive uninterruptedly.

3. Parents should allow their wards to be involve in cultural practices in order for them to be abreast with the concepts that may improve their learning of mathematics.
4. Counting in mother tongue languages can greatly improve students' knowledge in mathematics and offer the teachers an easier way of passing knowledge to the students.

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