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MOTHER TONGUE AS AN ESSENTIAL TOOL FOR IMPROVING BASIC SCHOOLS PUPILS' PERFORMANCE IN ELEMENTARY MATHEMATICS IN OYO NIGERIA

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Abstract
This study investigated the effect of mother-tongue (Yoruba language) on primary school pupils' performance in basic elementary mathematics. Quasi-experimental design of the type pre-test, posttest, non-randomized and non-equivalent control group was used. The population for the study are all the primary two elementary pupils in Afijio local government area of Oyo state. The target population was 63 pupils from two selected primary schools in Afijio local government area. Purposive sampling technique was employed to choose the school for the experimental study while random sampling was employed to select the other school, intact class was used in both schools. The instruments used were basic elementary mathematics performance test (BEMPT) and basic elementary mathematics retention performance test (BEMRPT). The instruction lasted for eight weeks, using a unified basic two elementary mathematics syllabus, designed by the Federal Ministry of Education. The test –retest method was employed for the reliability of the test instruments. The Pearson Product Moment Correlation Coefficient (r) was 0.86. Data collected were analysed using t-test and analysis of covariance (ANCOVA). Three hypotheses guided this study. Findings revealed a significant difference in performance, retention and ability level using mother tongue as a means of instruction among others. Mother-tongue is an essential ingredient to teaching and learning of basic elementary mathematics in primary schools. Therefore it is recommended that schools should employ the use of mother tongue at the first stage of school.

Keywords: *Mother tongue, performance, mathematics.*

Introduction

Education develops the mind of a human being through learning, and these can be achieved in different places of learning such as homes, streets, religious institutions like churches and mosques, schools, colleges or universities among others. It is also a process whereby a person develops attitudes and abilities that are considered to have value and relevance in the society using either the language of the community (mother tongue) or the official language of the country where the town lies.

Mother tongue is referred to as a child's first language. Nwali (2014) and Ivan (2018) sees mother tongue as the local language of a group of people living together in a community. The first language a child learns to speak is his mother tongue (Hornby 2010). He added that it is the form of communication spoken by a group of people living together in an area and the language spoken may be different from others. These differences are usually in terms of grammar, words, writing, pronunciation etc. that may be different from other forms. Mother tongue is synonymously used with other terms like dialect and language of the immediate community. With the opinion of Nwali and Hornby, it is observed that a mother has a lot to do with the cognitive exposure of every child to things surrounding him.

Since the introduction of formal education by the colonial masters into Nigeria, English Language was introduced as a medium of instruction in our schools. Emphasis on the use of English language is still much felt in educational institutions in Nigeria as the various policies of education have classified the subject as a major discipline. 'The 1882 Education Ordinance, for example, capitalised on the use of English language as a medium of classroom interaction. Up till the present moment, it is essential to have at least a credit pass in English language at the school certificate level before a candidate could be admitted into any of the Nigerian Universities. Emphases are also laid on passing the subject before entering other tertiary institutions in the country. Also, the current National Policy on Education (NPE) indicates the importance of English language despite its preference for the Nigerian child's mother-tongue as the medium of instruction in nursery and the first three years of primary education (Oribabor and Adesina, 2013).

It should, however, be noted that some educators frown at the position of English language as a compulsory subject in our schools. They argued in favour of mother tongue used as a medium of

communication and instruction in the classrooms. The National Policy on Educations' provision for the use of local language to teach in the nursery and at least, three years of primary education in Nigeria, made pupils learn one of the three major Nigerian languages; Hausa, Igbo and Yoruba. Despite so many of these pupils and student are not from any of these languages. Some researchers argue out that teaching the child's mother tongue may encounter problems like assigning meaning to some mathematical expressing, symbols, illustration signs among others and most of the time borrows verbatim the term as it is in English language.

In line with the provision of mother-tongue instruction as a medium of instruction in nursery institutions, Fafunwa (1982) as cited in Oribaror and Adesina (2013) observed that if the Nigerian child is to be encouraged from the start to develop curiosity, initiative industry manipulative ability. Spontaneous flexibility, manual dexterity, mechanical comprehension and the coordination of hand and eye. He/she should acquire these skills and attitudes through his mother tongue. Fasanmi and Adesina (2003) state that a child will learn faster and better if taught in his mother tongue at the early stage of his education. It was identified that the mother tongue instruction would help the children to acquire facts and information quickly, interpret information obtained correctly and adequately acquire practical and manipulative skills easily anti quickly and acquire and develop desirable attitudes towards people. In the same vein, Durojaiye (2002) supported the use of English language for teaching and instruction at the nursery school level in Nigeria. Their arguments include the problem of multilingualism, nature of the locations of schools and the support shown by many parents for English language as a good measure of teaching their children. Children learn better in their mother tongue. UNESCO has encouraged mother tongue instruction in primary education since 1953 (UNESCO, 1953) and UNESCO highlights the advantages of mother tongue education right from the start: children are more likely to enrol, succeed and perform in school (Kosonen, 2005). Parents are more likely to communicate with teachers and participate in their children's teaching (Benson, 2002). Some parents in rural areas cannot communicate well in English, but only their first language. Girls and rural children with less exposure to a dominant language stay in school longer and repeat grades less often. (Hovens, 2002; UNESCO Bangkok, 2005).

Unfortunately, the use of mother tongue in teaching and learning mathematics in our primary schools have not been encouraging. The introduction formal education to Nigeria paid little or no attention devoted to the teaching and learning of mathematics using the indigenous language of the people, rather than using a foreign language English. It is always true that charity begins from home, and the child learns better from known to the unknown of his or her mother tongue. Mathematics is a logical science upon which other subjects depends on, and it is a foundation for social life and the exploration of the universe. It is a foundation for social life and the exploration of the universe. Mathematics can also be seen as the science of numbers, size and order (Obodo 2010). The usefulness of mathematics makes it a core and compulsory subject in both primary and secondary schools curricula for all learners as enshrined in the National Policy on Education (FRN, 2013). National Council of Teachers of Mathematics (NCTM), 2014) recommended for access and equity. It calls for mathematics programmes which require that all pupils have access to a high-quality mathematics curriculum, effective teaching and learning, high expectations, the support and resources needed to maximise pupils'/learners potentials.

Ale (2006) opined that mathematics up till now is still the most serviceable science subject to all disciplines and fields of human endeavours?

The objectives of the mathematics curriculum for primary school pupils, as revised in 2012 are as follows:

i. Acquire mathematics literacy necessary to function in an information age.
ii. Cultivate the understanding and application of mathematics skills and concepts necessary to thrive in the ever-changing technological world.
iii. Develop the essential elements of problem-solving, communication, reasoning and connection within the study of mathematics.
iv. Take advantage of the numerous career opportunities provided by mathematics.
v. Become prepared for further studies in mathematics and other related fields.

Anyagh, O'kwu & Imoko (2016) sees poor achievement in mathematics and mathematics-related courses as one of the major problems in Africa. It is a result of inadequate understanding of the language of instruction as a significant source of under-achievement in school mathematics (Anyagh, Imoko and Anyor, 2017).

Whorf, (1956) suggested that language determines and defines thought. Anyagh, (2012) identified the vital role that language plays in mathematics achievement of pupils' in acquiring mathematical concepts, skills and their ability level. Also, the ability level is the grouping of pupils' performance into low, medium and high scorers based on their intellectual ability or performance in the terminal examination. The ability level of pupils differs from one student to another irrespective of the mother tongue.

Yoruba is a language spoken in West Africa. The number of speakers of Yoruba is approaching 80 million. It is a pluricentric language spoken principally in Nigeria and Benin, with communities in Sierra Leone, Liberia other parts of Africa, the Americas, and Europe (Wikipedia 2019). Yoruba people live mostly in South-West Nigeria states of Oyo, Ogun, Osun, Lagos, Ondo, Ekiti and Kwara. Some part of Kogi and Edo have some Yoruba settlements but are not primarily recognised as Yoruba State. They have developed a variety of different art forms, including pottery, weaving, beadwork, metalwork, and mask making. Most of the artworks were to honour the gods and ancestors, and since there are more than 401 known gods to the Yoruba, there is much sculpture and artwork made.

The successful use of mother-tongue instruction in the classroom depends on the teachers and the support they receive from other stakeholders within and outside the education system (Chilora and Harris 2001). Teachers played significant roles in the implementation of both mother tongue instruction policy and other educational reforms at the classroom level (Littlewood 1981; Wright 1987). Discussion on the use of the mother tongue as a veritable instrument for teaching and learning in schools was espoused by Ross (2004) and Fafunwa (1977) when he mentioned that mother tongue education develops the cognitive, affective and psychomotor development of learners in the class.

Statement of the Problem

The use of mother tongue in teaching primary schools children faced a lot of problems as many school authorities still forbid the use of mother language for teaching-learning process in their schools, especially the private schools. Meanwhile, some schools believe that once the use of mother language can aid the academic performance of their pupils, it is acceptable. Yoruba language, like other indigenous languages, has been facing a lot of challenges, particularly as a language of learning and teaching (LOLT) (Babajide, Nkidi, Ina and Cycil 2014). They noted that the implementation of mother-tongue as a medium of instruction is both demanding and expensive. It entails a lot of resources to produce teaching and learning materials and to train teachers. Currently, no concrete efforts have been made by the Nigerian government to face the challenges of implementing the mother-tongue medium policy. Chisunum and Ezie (2014) explain that the use of mother tongue in the teaching and learning process has been an issue of debate among educators. In other views, most teachers feel that the use of mother tongue should be erased and they feel guilty if they use it a great deal. When challenged, they find it difficult to say why. Against the use of mother tongue is the general assumption that the teaching-learning process should be administered English. It is against this background that the researcher is interested in finding the effects of mother tongue on the academic performance of primary school pupils in elementary mathematics and also against their ability level.

Purpose of the Study

The study determines the effect of effects of mother tongue on the academic performance of primary school pupils in elementary mathematics and also against their ability level. Explicitly, the research studied:

i. To determine the impact of mother tongue on the academic performance of primary school pupils in elementary mathematics.
ii. Investigate the extent to which pupils retain the knowledge when mother tongue is used as a medium of instruction.
iii. To determine the influence of mother tongue on the ability level of the pupils in basic elementary mathematics.

Research Hypotheses

H_{o1}: There is no significant difference in the academic performance of primary school pupils in elementary mathematics using mother tongue as a means of instruction and those not exposed to mother tongue.

H_{o2}: There is no significant difference in the retention level of pupil's knowledge in elementary mathematics using mother tongue as a medium of instruction.

$H_{03:}$ There is no significant difference in the performance of high, medium and low ability levels of pupils using mother tongue as a medium of instruction.

Methodology

The research designs adopted was quasi-experimental design of the type pre-test, posttest, non-randomized and non-equivalent control group. Two groups were involved: the experimental group and the control group. Both groups were subjected to pre-test, posttest and retention test. Purposive sampling technique was used to select the school for the experimental study base on the fact that the teacher must have the ability and mastery of subject matter using mother tongue while the other was randomly selected. Intact class were used in both schools. The target population for this study consisted of all primary two (2) school pupils in Afijio local government of Oyo State.

A total of 63 (sixty-three) primary school pupils were involved in the study. The selected sample had 33 (thirty-three) pupils for the experimental group and 30 (thirty) pupils for the control group. The instruments used were basic elementary mathematics performance test (BEMPT) and basic elementary mathematics retention performance test (BEMRPT). The reliability of the instrument was carried out on another intact class in a school in the population who did not participate in the main study using the test-retest method. The Pearson Product Moment Correlation Coefficient was used to analyse the scores obtained, and a reliability coefficient of 0.86 was obtained for the instrument. The study lasted for a period of eight weeks. Six weeks was used for active teaching using mother tongue while the first and the eight weeks were used for ethical reviews and to administer the pre and posttests respectively for the two groups.

Data Analysis and Results

The data collected from the research work was analysed using t-test and analysis of covariance (ANCOVA).

Hypothesis 1: There is no significant difference in the academic performance of primary school pupils in elementary mathematics using mother tongue as a means of instruction and those not exposed to mother tongue.

Table 1 indicates the posttest mean score of the experimental group as 21.70 and that of the control group as 13.03 and the mean difference of 8.67 in favour of the experimental group. The table further shows that the difference in the mean of the pupils exposed to mother tongue as medium of instruction and those in the control group was statistically significant since the p-value of 0.012 was less than 0.05 alpha level of significance. These show that the mean of posttest scores of the experimental group of 21.70 was significantly greater than the mean of posttest scores of the control group of 13.03. Hence, the null hypothesis 1 which states that there is no significant difference in academic performance of basic school pupils in elementary mathematics using mother tongue as a means of instruction and those not exposed to mother tongue and those not exposed to the strategy was not accepted.

Hypothesis 2: There is no significant difference in the retention level of pupil's knowledge in elementary mathematics using mother tongue as a medium of instruction.

Table 2 shows the retention mean scores of the experimental group exposed to basic elementary mathematics retention performance test (BEMRPT) to be 19.98. In contrast, the retention means scores of the pupils in the control group taught using their regular maths teacher is 11.02. The mean difference of 8.96 between the two groups shows that the experimental group performed better than the pupils in the control group in the BEMRPT.

Table 1: **Independent sample t-test of the pupils exposed to mother tongue as means of instruction and the control group**

Test	Group	N	Mean	SD	S Error	Mean Diff.	Df	t-value	p-value
Pre-test	Experimental	33	10.02	4.10	0.48	0.71	61	0.14	0.887
	Control	30	9.49	3.68					
	Experimental	33	21.70	5.00	0.72				

Post-test					8.67	61	9.31	0.012
	Control	30	13.03	4.07	0.72			

Table 2: Independent sample t-test indicating the difference in retention test mean scores of pupils exposed to mother tongue as means of instruction and in the control group

Group	N	Mean	SD	S Error	Mean difference	Df	t-value	p-value	Decision
Experimental	33	19.98	4.14	0.47					
					8.96	90	12.77	0.000	H_{O2}
Control	30	11.02	3.10	0.35					Rejected

Table 2 also reveals that statistically, a significant difference existed between the pupils exposed to mother tongue as a means of instruction and their counterparts in the control group not exposed to mother tongue in the BEMRPT since the p-value of 0.000 is less than 0.05 level of significance. These imply that the retention mean score of 19.98 of pupils exposed to mother tongue as a means of instruction was significantly greater than those of the control group of 11.2. Therefore, the researchers failed to retain the null hypothesis which states that there is no significant difference in the retention level of pupil's knowledge in elementary mathematics using mother tongue as a medium of instruction and the counterparts in the control group.

Hypothesis 3: There is no significant difference in the performance of high, medium and low ability levels of pupils using mother tongue as a medium of instruction.

Table 3: Description of pupils' performance of primary school two pupils using mother tongue as medium of instruction based on ability level

Ability level	N_1	Pretest	SD	N_2	Posttest	SD	Mean gain Score
High 3	21.00	0.00	4	22.61	2.68	1.61	
Medium	13	14.00	2.73	26	14.42	2.31	0.42
Low	17	7.76	1.97	3	9.87	0.58	2.11

Table 3 shows the mean gain scores of pupils and also reveals that low ability pupils benefited most with the mean gain score of 2.11 with an upward movement 14 pupils to the medium ability level, followed by the high ability pupils with 1.61, and medium ability pupils had the least mean gain score of 0.42.

Table 4: ANCOVA computation based on ability levels of pupils taught using mother tongue as medium of instruction

Source	Type III Sum of Squares	df	Mean Square	F	Sig.
Corrected Model	662.123[a]	6	110.354	34.467	.000
Intercept	119.855	1	119.855	37.435	.000
PRETESTEXPG	65.066	1	65.066	20.322	.000
CLASSOFSCORELEVELPOSTTEST	40.864	2	27.032	6.382	.005
Error	92.849	29	3.202		
Total	9435.000	36			
Corrected Total	754.972	35			

a. R Squared = .877 (Adjusted R Squared = .852)

Table 4 further showed that there is a significant difference in the performance of high, medium and low ability level pupils taught basic elementary mathematics using mother tongue, Analysis of Covariance was used, and the result was presented in the table above. Since the p-value of 0.005 is less than the significance level of 0.05, therefore the null hypothesis is therefore rejected, and it was concluded that at least one of the levels taught basic elementary mathematics using mother tongue better performed significantly different.

Discussion

The study was aimed at finding out the effects of mother tongue on the academic performance of primary school pupils in elementary mathematics and also against their ability level among Yoruba primary school pupils in Oyo State. It was discovered that the use of the mother tongue in teaching and learning, help pupils to perform better in basic elementary mathematics than their counterpart in the control group. Also, the experimental group have a high retention of what has been taught to them using their mother tongue. This show that mother tongue gave the pupils an in-depth understanding of what is taught than the usual conventional methods used. The ability level of the low pupils had a significant difference as they benefited the most. Findings from this are in line with the results of UNESCO (2005, 2008 & 2008b) on mother tongue instruction in the elementary school irrespective of their class at that level.

Conclusion and Recommendation

Based on the findings, mother tongue as a strategy of teaching basic elementary mathematics raised pupils' academic performance than the conventional method of using English Language. Using mother tongue increases the activity of the pupils in their classrooms, thereby marking it a pupil-centred activity. These give the pupil's in-depth understanding of what is taught and hence increase performance. Teachers at this level should be encouraged to use mother tongue or at least combine mode with the English language to increase understanding during the teaching and learning process as it enhances pupils performance.

Based on the findings of the study the following recommendations were made:

1. Mathematics teachers should be exposed to workshop /seminars on how to use mother tongue for effective and efficient method to teach basic elementary mathematics to the pupils.
2. The Federal Ministry of Education and stakeholders in education should organise workshops; seminars and conferences where mathematics teachers could fully explore the use of mother tongue and integrate it into the teaching/learning process.
3. Authors of mathematics textbooks should write their books with so many illustrations using some localised instructional materials in the community.
4. Teachers, parents and guardians can assist their children in teaching them using a combination mother tongue and English language for better understanding. Also, they should not forbid the use of mother tongue if it will assist in the knowledge of the concept taught.

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