The Impact of Mother Tongues on the Achievement of Children in Mathematics in Nigeria: An Experimental Approach

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Abstract

The study investigated the impact of mother tongues on pupils' academic performance in mathematics among pupils in Lagos and Oyo States of Nigeria taken some selected public primary schools in both states as a case study. Eighty (80) pupils were chosen for the study. Twenty (20) pupils were selected from Igbo language speaking background, twenty (20) pupils were selected from Yoruba speaking background, twenty (20) pupils were selected from Hausa speaking background and another twenty (20) pupils were selected regardless of their ethnic group who are taught with English language. A lesson note was developed to maintain uniformity in the teaching of the pupil. Mathematics Achievement Test was administered after teaching and scores were collated for analysis. T-test and Analysis of variance (ANOVA) were used in the analysis of the data collected. The findings reveals that there is significant difference between the performances of pupils in control group and the experimental group I; there is significant difference between the performances of pupils in control group and the experimental group II; there is significant difference between the performances of pupils in control group and the experimental group III; and there is relationship between the performance pupils in experimental group I, II and III. Recommendations were put forward that the government should encourage code-mixing in teaching during Mathematics lessons for better understanding of concepts taught.

Keywords: Mother Tongue, Pupils' Academic Performance, English and Yoruba Language

Introduction

As the world stands on the threshold of the 21st century, every country is trying to achieve as much as possible. Over the years, many ideas have been put forward as to how Nigeria could achieve this feat that makes some countries more successful than others. In Nigerian schools, English is the only language of instruction in the classroom and since English is a foreign language to students, it affects students' academic performance not only in Mathematics but across all subjects. For this reason, students who have communication problems may not perform well not only in English but also in other courses (Cummins, 2020). Poor performance in Mathematics may be due to students' weak foundation in English Language which may be related to the conflict between the mother tongue and English language. Because in this world, children firstly to see mother tongue as a means to understand ideas. But when they grow up, sooner or later they realize that the instructions at schools are in English language.

Students struggle between two languages of thought, social, business and education (Olarewaju and Akinwunmi, 2018). To this end, many scholars in Africa have been trying for years to find a universal language other than English as a teaching tool. While talking about the national languages of Nigeria and Africa, Adesanoye (2021) meticulously mentioned Swahili, Wasobian and "Guosa" languages, as claimed by other researchers. However, none of the alternatives suggested by these scientists to English language have survived to the present day. There is no doubt that man's constant friendship with his environment (whether direct, intellectual or distant has led to the accumulation of experiments since his creation) and (Adesanoye, 2004).

The use of African languages as educational tools in Nigeria has a long history. Metalanguage consists of words, knowledge and teaching (Adesanoye, 2004). The development of metalanguage in Nigeria is based on the government's National Education Policy, which stipulates that the language of instruction in the first three years of primary education should be the mother tongue of the students. Moreover, Nigerian government recognises the three major languages (Hausa, Igbo and Yoruba) as important subjects for school students (Adesina & Oribabor, 2021). Amidst language teaching in primary and secondary schools, teaching continues in teacher training institutions across the globe where pre-teachers are given good training on using effective use of language in teaching. Mathematics Scholars are not left out in their day to day researches on improvement of teaching methodology where the use of language is not an exception. For these reasons, the development of mathematical concepts is considered an important part of language preparation. Dictionaries of basic

mathematical concepts have been created in some languages and softwares to assist teaching and learning of Mathematics.

According to Oluwole, (2018) quoting Adebayo (2008) stated that mother tongue can be defined as the language that a group of people, living in an area with the same believe acquired at an early age before acquiring other languages. The first language a child understands is his mother tongue. According to this, a person is defined as a native speaker. In general, children learn the content of their native language at home (Webb, & Kembo-Sure, 2020). It is generally accepted that the child's language is important in teaching and learning in Mathematics. On the other hand, it divides a large part of the child's environment, that is, it gives names to most of the objects, characters, ideas, objects and other things that are important to him/her and to entire nations. Mother's language is the basis of the child's environment and language development.

The fact that the Federal Ministry of National Education, in cooperation with other legal institutions, included the use of the mother tongue in the National Education Law published in 1977 and revised in 1981, acknowledges the importance and contribution of the mother tongue to education to teach secondary, pre-school and primary school students, unfortunately in Nigeria, the rules apply as they are; rules do just that. They are not used appropriately. Olarewaju and Akinwunmi (2018) concluded that both students and teachers agreed that Mathematics should be taught to Nigerian students in Nigerian languages, that is, Hausa, Ibo and Yoruba and therefore this was considered to be the real solution to the poor performance of students in Mathematics.

A report by the United Nations Educational, Scientific and Cultural Organization (UNESCO) (1953) noted the importance of using the mother tongue as the medium of instruction in early education. UNESCO (1953) say: It is a fact that the best way to educate a child is his character. From a psychological perspective, mother tongue is a system of important symbols that the human heart uses to teach and understand. From a health perspective, mother tongue is a description of people in society who learn unfamiliar words faster. Based on the above observations, learning in the mother tongue accelerates the learning process because the learner is assumed to know the language. The United Nations Educational, Scientific and Cultural Organization (2016) believes that reading and second language skills are dependent on good first language skills; that is, knowledge of the mother's language. However, the United Nations Educational, Scientific and Cultural Organization (2015) warn that the mother tongue is not the language spoken by the child from the parents and is not the first language the child speaks. A mother tongue is a language that is acquired early in life and becomes a means of thinking and communication (UNESCO, 2013). But in most cases the language will be the language spoken by the parents, as parents are often the first to come into contact with their children and therefore their language.

The success of the Ife Six-Year Primary Project of Fafunwa in 1970s continues to inspire studies into the indispensable role of the mother tongue as a medium of instruction in primary schools in Nigeria. The main objective of the Ife Six-Year Primary Project was to develop a coherent primary education that would use the mother tongue as the medium of instruction. The study has been corroborated by many others including Arnold (2023) who quoted Galileo (2011) that "The great book of nature can be read only by those who know the language in which it was written, and that language is Mathematics" and that "Mathematics is the way to understand all sorts of things in the world around us." The explanation is that a child will learn faster and better in Mathematics if taught in his/her mother tongue at the early stage of his/her education. It was identified that the mother tongue instruction will help the pupils to acquire facts and information easily and quickly.

Moreover, Mathematics can be referred to as both the gate and key of the Science; while every subject is taught through language. Hence, the need to examine the relationship between the very important subject in the light of the first language of the learner in Nigerian context where majority of school pupils come from homes where English is not used at all in communication.

Statement of the Problem

Mathematics is a core skill for all children in life generally; a mathematically well educated population will contribute to the country's economic prosperity; hence, there is need to study the place of mathematics education and how mother tongue contributes to the learning and understanding of mathematics. The researchers observed that Nigerian's indigenous languages have been rendered unimportant in the comity of nations as a means of communicating ideas, particularly in the teaching of the subjects that seems to be abstract in nature like mathematics which had eventually led many pupils to develop negative attitude towards the subject. It has been noted that some primary school pupils cannot interpret mathematical language correctly thereby increasing poor performance in the subject. Theories have been put forward to support the uses of mother tongues in teaching children, especially in lower primary schools across the country and documented in the National Policy on Education. This research sought to practically investigate the

impact of mother tongues on the teaching and learning on mathematics achievement across the three (3) major languages in Nigeria.

Purpose of the study

The main purpose of this study is to investigate the impact of mother tongues on the achievement of children in mathematics in Nigeria. The specific purposes are to find out

1. If there is significant difference between the performances of pupils in control group and the experimental group I.
2. If there is significant difference between the performances of pupils in control group and the experimental group II.
3. If there is significant difference between the performances of pupils in control group and the experimental group III.
4. If there is relationship between the performance pupils in experimental group I, II and III.

Research Hypotheses

The following hypotheses guided the study

$\mathbf{H}_{01}$: There is no significant difference between the performances of pupils in control group and the experimental group I.

$\mathbf{H}_{02}$: There is no significant difference between the performances of pupils in control group and the experimental group II.

$\mathbf{H}_{03}$: There is no significant difference between the performances of pupils in control group and the experimental group III.

$\mathbf{H}_{04}$: There is no relationship between the performance pupils in experimental group I, II and III.

Significance of the Study

This study provides useful information to all education stakeholders who include the government, Institutes of Education, teachers, students, parents and communities at large. Specifically, the school administration will be able to gather information that will be helpful in their endeavor to address school's language policy issues in terms of focus on use of mother tongue in school and how it influences performance in mathematics and by extension academic performance.

Scope of the Study

The study is to investigate the impact of mother tongues on the achievement of children in mathematics in Nigeria The study covers the pupils in some selected public primary schools in Oyo town of Oyo State, Ajeromi Ifelodun and Ojo Local Governments of Lagos State.

Methodology

The researchers use quantitative research approach for this study. The population for this research work was pupils in public primary schools in south western part of Nigeria. Eighty (80) pupils were randomly selected as sample. Twenty (20) pupils regardless of their ethnic groups and background was selected from St. John Primary School, Akinmorin, Oyo State tagged control group who was taught using English language and another twenty (20) pupils was selected from L.A Primary School, Alagbon, Oyo, Oyo state who was tagged experimental group I. Twenty (20) pupils was selected from St. Michael Primary School, Alaba, Ojo Local Government Lagos state (Igbo dominated area) and tagged experimental group II and twenty (20) pupils was selected from Community Primary School, Sasa-Ojo, Akinyele Local Government of Oyo state (Hausa dominated area) and tagged experimental group III. The experimental group I, II and III was purely pupils from Yoruba speaking, Igbo speaking and Hausa speaking backgrounds respectively. The experimental groups were taught using the mother tongues that is, Yoruba, Igbo and Hausa language.

The instruments used for this research was Mathematics Achievement Test (MAT) and Note of Lesson (for uniformity in teaching process) which was given both face and content validity by seasoned lecturers in the field of test and measurement of Educational Psychology Department, Emmanuel Alayande College of Education Oyo, Oyo State now Emmanuel Alayande University of Education Oyo, Nigeria. The instruments were administered on the pupils of St. Michael School, Oke Ebo, Oyo, Oyo State for reliability test and a reliability co-efficient of 0.89 was obtained using a test-retest method of reliability testing.

Service of indigenous teachers was employed to teach some mathematical concepts to students of selected schools with mother tongues and administer the research instrument to the students. The teachers marked and recorded their scores which are analysed using simply t- test statistic and Analysis of Variance (ANOVA) at 0.05 level of significance.

Results Presentation

The results of the work were organized in accordance in the research hypotheses as follow:

Hypothesis 1: There is no significant difference between the performance of pupils in control group and the experimental group I.

Table 1 : *Mean, Standard Deviation and t -test Statistic of Students* performance *in control group and the experimental group I*

Group	No	□	S.D	t-cal	□	df	Remarks
Control group	20	6.00	14.36				Reject the null
Experimental group I	20	7.90	25.40	4.50	1.66	38	hypothesis

Since t-cal (4.50) is greater than t-tab (1.66), the hypothesis that there is no significant difference between the performance of pupils in control group and the experimental group I is rejected.

Hypothesis 2: There is no significant difference between the performance of pupils in control group and the experimental group II.

Table 2 : *Mean, Standard Deviation and t -test Statistic of Students* performance *in control group and the experimental group II*

Group	No	□	S.D	t-cal	□	df	Remarks
Control group	20	5.01	12.16				Reject the null
Experimental group II	20	8.10	24.10	4.5066	1.68	38	hypothesis

T-calculated (4.5066) is greater than t - tabulated (1.68), the null hypothesis that there is no significant difference between the performance of pupils in control group and the experimental group II is also rejected

H_{03}: There is no significant difference between the performances of pupils in control group and the experimental group III.

Table 3 : *Mean, Standard Deviation and t -test Statistic of Students* performance *in control group and the experimental group III*

Group	No	□	S.D	t-cal	□	df	Remarks
Control group	20	4.05	15.16				Reject the null
Experimental group III	20	8.65	23.40	4.401	1.68	38	hypothesis

T-calculated (4.401) is greater than t tabulated (1.68), we therefore reject the null hypothesis that there is no significant difference between the performances of pupils in control group and the experimental group III.

H_{04}: There is no relationship between the performance pupils in experimental group I, II and III.

Table 4: ANOVA [a]

Model		Sum of Squares	df	Mean Square	F	Sig.
	Regression	12.102	1	12.102	44.776	.000[b]
1	Residual	26.488	78	.270		
	Total	38.590	79			

Since the significant level (0.00) is less than the critical value (0.05), we reject the null hypothesis and accept the alternative hypothesis that there is relationship between the performance pupils in experimental group I, II and III.

Discussion of Findings

Table 1 showed that there is significant different between the performance of pupils in control group and the experimental group 1. It was discovered that the students in the experimental group performed better than their peers in the control group. This presumes that the pupils taught with mother tongue understand the concepts taught better. This is in corroboration with the view of Bamgbose, (2020).

Table 2 in the result presentation showed that there is significant difference between the performances of pupils in control group and experimental group II. This commemorates the result of experimental I. The impact of mother tongue is clearly showed considered the results of experimental groups. This is in line with the opinion of Ezeokolo, (2015). Table 3 further revealed that there is significant difference between the

performance of pupils in control group and experimental group III. This commemorates the result of experimental I and II. This is in line with the opinion of Ezeokolo, (2015).

Furthermore, table 4 revealed that there is a relationship between the performance pupils in experimental group I, II and III. The performances of pupils in the three experimental groups are closely related as observed in their score. This shows that the pupils understand the mathematics concepts that in their different mother tongues than been taught in foreign language which is English language. This is in corroboration with the view of Abubakar, (2005) which dwell more on importance of mother tongue to teaching and learning.

Conclusion and Recommendations

Essentially, the above argument shows that use of mother tongue is favorable for learners especially at the elementary level. It implies that when English is used at elementary level, it becomes a challenge in terms of making sense out of the abstract ideas. It could therefore be concluded that mother tongue has effect on students' academic performance in mathematics based on this finding and that there is no correlation between students' academic performance taught with English language and mother tongues (Yoruba, hausa and Igbo language). The important of what we are saying is that scientific and technological attainment begins with language best suite is the mother tongues.

Based on the findings of this study, it was recommended that teaches of mathematics should be encourage to use code mixing during the class. They should desist from speaking English language from the beginning of the class to the end. Also, National Policy on Education stated that lower primary classes should be taught in mother tongues but this is not in practice especially, in private schools. Government should constitute a committee to monitor and enforce the policy.

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