Effects of Medium of Instruction (Yoruba Language) on Secondary School Students' Performance in Mathematics

By Ayodeji Modupe Ayodele, Ojo Amos Adewale & Daramola Kayode Raphael

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Strictly as per the compliance and regulations of:

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Abstract- Mathematics is one of the core subjects in secondary education and a good performance in the subject is a key to gaining admission into higher institution of learning. In any mathematical educational setting, the role of language cannot be deemphasized as it is a major tool that often determines the learning outcome of learners in the subject. To this end the medium of instruction in mathematics classroom should be one that the learners can easily decipher. This study therefore, investigated the effects of mother tongue as supplementary medium of instruction on junior secondary school students' performance in Mathematics in Ekiti State, Nigeria. The purpose was to examine the effectiveness of mother tongue as a supplementary medium of instruction. The study adopted a three group pre-test post-test quasi experimental research design. The sample for the study consisted of 194 junior secondary school one students selected from three secondary schools in Ekiti State through multistage sampling procedure. One research instrument tagged Mathematics Performance Test was used for data collection in the study. MPT had a reliability coefficient of 0.82. Data collected were analyzed using mean, standard deviation, t-test, ANOVA and ANCOVA. Results of the study showed that those exposed to mother tongue as supplementary medium of instruction performed better than those not so exposed. Based on the findings it was concluded that mother tongue as supplementary medium of instruction is an effective medium of instruction for mathematics. It was therefore recommended that teachers should be more dynamic in their choice of instructional medium during classroom interactions rather than sticking to the conventional medium of instruction which may not be productive to the learner.

Keywords: performance, mother tongue, instructional medium, mathematics.

I. Introduction

In the teaching and learning of Mathematics, language is important for effectiveness of the teaching and learning process. It is the major tool which mediates interactions between teachers and learners and also between the learners. Studies have shown that in teaching and learning of Mathematics, the issue of language cannot be overlooked. For instance, Popoola (2013) suggested that teachers may be able to calculate and arrive at the right answers when solving problems given to their students, but may end up creating more issues as a result of their inability to fully explain the technical terms and show their meaning in terms of daily use and application. In a study, Durkin in Ayodeji (2017) made the claim that language is the foundation of mathematics education, that language determines its progress and setbacks, and that language is frequently used to evaluate its achievements. Studies such as Bermejo et al. (2021) and Nkode et al (2018) also support this assertion. This portends the fact that the performance of students in Mathematics cannot be dissociated from the medium of instruction. This is probably why Setati (2005) advocated the need for further studies on the relationship between language and the teaching and learning of Mathematics.

Thus, it may be necessary to instruct pupils/students in the language they understand and which they can decipher easily. The mother tongue/language of the environment may therefore, be the best language for this purpose as against the use of a learner's second language as it is obtainable or practiced in most African countries.

The Federal Government of Nigeria (FRN, 2013) in her National Policy on Education, expressly stated that the language of instruction for the first four years of schooling for every Nigerian child will be the mother tongue of the child, but despite the existence of this policy on paper, the implementation is not enforced comprehensively. It is disheartening to know that as at today, except in some areas in the northern part of the country, the language of the environment or mother tongue is labeled as vernacular in the schools and pupils/students are being made to pay fine in some schools for speaking their mother tongue. This shows that basic mathematical concepts that should have been introduced at this level of education in the child's mother tongue were introduced using the child's second language which probably he/she is just learning. This may inhibit the performance of learners in Mathematics. Over the years the poor and fluctuating performance of students in Mathematics has been a source of concern to stake holders and despite several strategies mounted up in schools, dwindling performances are still recorded yearly. This has necessitated the need to find other

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means through which the performance of students can be improved in the subject. This study is therefore focused on medium of instruction as a factor that can improve or impair the performance of students in Mathematics.

Like most African countries, Nigeria has a language policy on Education which is poorly implemented or not implemented at all in some areas of the country. Being a multilingual nation the policy adopted the three main languages: Igbo, Yoruba and Hausa languages as medium of instruction in the first four years of schooling for every child in the country. However it has been observed by various researchers such as Ayodeji (2017) and Adenegan, Raji and Adenegan (2014) at different times that this policy is literally on paper. The weakness in the implementation of this policy has therefore caused a dearth of availability of instructional materials in these mother tongues as most textbooks are prepared in English language which appears to be the favoured language of instruction in the classroom. There is however, an avalanche of research on the use of mother tongue in the country as an important factor to improve the performance of students in various subjects. Notable among these researches is the experiment code named Ife Six Year Primary Project at the end of the research project it was established, that mother tongue can be used effectively as a medium of instruction in the classroom. Fafunwa, Macauley and Funso-Sokoya (1989) observed that children who participated in the project who turned to technical pursuit proved more resourceful later than their counterparts from other schools. In recent times researchers such as Osungbemiro, et al, (2013) and Awopetu (2016) also corroborates the findings of Fafunwa(1975). While researches have been carried out on the use of mother tongue as the only medium of instruction in primary schools in the country, little had been done on the use of mother tongue as a supplementary medium of instruction in the teaching and learning process.

The use of Yoruba language in the teaching of Mathematics has been advocated by notable researchers such as Fafunwa (1975) and Oluwole (2014). Worthy of note is the fact that the Yoruba counting system take cognisance of the four basic arithmetical operations, namely; division, multiplication, addition and subtraction (*pinpin, isodipupo, aropo, & ayokuro*). Adenegan, *et al* (2014) affirmed this in their submissions that, it can easily be deduced that in the Yoruba counting of higher numbers, addition, subtraction, multiplication and division take their places in the nomenclature. They then opined that if the curriculum planners can incorporate indigenous language teaching into Mathematics curriculum, there will be remarkable improvement in the teaching and learning of Mathematics.

The viability of Yoruba as a medium of instruction has been proved over and over by researchers who had at one time or the other carried out researches in this area of study. The experiment carried out by Fafunwa between 1971 and 1983 is one of such researches that have proved the viability of the Yoruba language. The six-year project according to Abidogun (2012) was aimed at giving the child an all-round education that should cut across the three domains of learning (cognitive, affective and psychomotor). For those six years, English language was taught as a subject while the language of the classroom was the Yoruba Language, Ejieh (2004), noted that steps taken to achieve the implementation of the programme included the designing of curriculum and relevant teaching aids. Indigenous language, as opined by Oluwole (2014), should be the only means of passing instructions in Nigerian primary and secondary schools. He further enjoined the Federal Government of Nigeria to place Yoruba language on the same pedestal as English language and French which are made compulsory subjects in our schools.

However, as viable as Yoruba language as medium of instruction is, there are challenges that may be inimical to its viability. Such challenges include lack of written resources needed to teach the subject as well as inability to find a linguistic equivalent of some mathematical terms in the indigenous language. Thus, it is the opinion of the researcher that the use of mother tongue can be supplementary to the lingua franca that is, it can be used in explaining terms in such a way that the learner would be carried along in the lesson, thus effectively introducing the learners' mother tongue in the teaching and learning of Mathematics and also serving as a panacea to the observation that the teaching of Mathematics in basically Yoruba language may be hampered due to the lack of resources needed to teach effectively. The researcher has also observed that the insistence of policy makers on the use of English language as medium of instruction in Mathematics classes seem not to have better the lot of the Nigerian learner of Mathematics.

The purpose of the study is to investigate the effects of using mother tongue as supplementary medium of instruction on students' performance in Mathematics. It examined the effect of mother tongue as a supplementary medium of instruction on students' performance in Mathematics Tests. To guide the study, one research question was raised.

a) *Research Question*

Will there be any difference in the performance of students when mother tongue is used as a supplementary medium of instruction in Mathematics?

b) Research Hypotheses

i. There is no significant difference in the performance in the performance mean scores of students in Mathematics in the experimental and control groups before the treatment.

ii. There is no significant difference in the performance mean scores of students in Mathematics in the experimental and control groups before and after the treatment.

iii. There is no significant difference in the performance mean scores of students exposed to Mother tongue as supplementary medium of instruction and those not so exposed.

II. Methodology

The population for this study consisted of 16,741 Junior Secondary School Class I (JSS 1) students in all the 187 public secondary Schools in Ekiti State of Nigeria as at the time of the study (Source: Ekiti State Ministry of Education, Science and Technology).

The sample for the study consisted of 194 Junior Secondary School One (JSS1) students selected from three schools in Ekiti State through multistage sampling technique. The first stage was the use of simple random sampling technique to select three local government areas (LGA) from the 16 LGAs in Ekiti State. The second stage was the use of purposive sampling technique to select one secondary school from each of the selected local government areas. The last stage was the selection of intact classes from each of the schools selected for the study.

A self constructed research instrument was used for the study tagged Mathematics Performance Test (MPT). It consists of two sections A and B. Section A comprises demographic variables such as name of school, class, age, sex and identification number, while section B consists of 40-item objective questions based on the topics in the school syllabus as at the time of the experiment. The instrument was prepared in two languages. (English and Yoruba). To validate the instrument for the study, it was subjected to face, content and construct validity by experts in the field of

Test and Measurements, seasoned Mathematics teachers and Yoruba teachers. The instrument was modified accordingly based on their criticisms and suggestions. The modified version of the instrument was used for data collection. The reliability of the instrument was ascertained using test re-test method of testing reliability. The instruments were administered on 20 Junior Secondary School Class One Students from a secondary school different from the schools selected for the study. The instruments were administered at an interval of two weeks. The set of scores obtained for the instrument were subjected to Pearson's Product Moment Correlation analysis. A reliability coefficient of 0.82 was obtained; this coefficient was considered relatively high enough to be used for the study.

The Experiment covered a period of ten weeks and the experimental procedure was in three stages; pre-treatment stage, treatment stage and post treatment stage. There were two (2) experimental groups and One (1) control group. Experimental group 1 were taught using mother tongue only as the medium of instruction while Experimental group 2 were taught using the mother tongue as supplementary medium of instruction. The control group was taught using the conventional medium of instruction which was English language.

Data collected were analyzed using descriptive statistics such as mean and standard deviation to answer the research question raised, while inferential statistics such as ANOVA and ANCOVA were used to test the research hypotheses.

III. Results

The research question raised was subjected to descriptive analysis.

Question: Will there be any difference in the performance of students when mother tongue is used as supplementary medium of instruction in Mathematics?

In order to answer the question the performance mean scores of students in the experimental and control groups were obtained and compared before and after the experiment. The result is presented in table 1.

Table 1: Students Performance in Mathematics based on the medium of Instruction

Medium of Instruction	N	Pre- Test		Post-test		Mean difference
		Mean	SD	Mean	SD	
Mother Tongue only	50	18.46	5.74	23.34	4.52	4.88
Mother Tongue as supplementary medium	61	18.48	5.44	27.18	4.55	8.7
Conventional Method	83	18.72	3.57	19.61	3.62	0.89

The table revealed that students exposed to mother tongue only medium of instruction had a pre-test performance mean score of 18.46 with standard deviation of 5.74 and a post-test performance mean score of 23.34 with standard deviation of 4.52, with a

mean difference of 4.9. Also, students taught with mother tongue as supplementary medium of instruction had a pre-test performance mean score of 18.48 with standard deviation of 5.44 and a post-test performance mean score of 27.18 with standard deviation of 4.55.

The mean difference of the group was found to be 8.7. Again, students exposed to the conventional medium of teaching had a pre-test mean score of 18.72 and a post-test mean score of 19.61 with a mean difference of 0.89. This implies that using different media of instructions had positive effect on the performance of students in Mathematics. However, the group exposed to mother tongue as supplementary medium of instruction performed best.

Hypothesis 1: There is no significant difference in the performance mean scores of students in Mathematics in the experimental and control groups before the treatment.

To test the hypothesis, the performance mean scores of students in the Pre-test Mathematics Performance test were compared for statistical significance at 0.05level of significance. The result is presented in table 2.

Table 2: Analysis of Variance of the pre-test performance mean scores of students in the experimental and control groups

Source of Variance	Sum of Squares	df	Mean Square	F	Sig
Between Groups	3.081	2	1.540	.066	.936
Within Groups	4434.260	191	23.216		
Total	4437.340	193			

Table 2 shows that $F_{(2,191)} = 0.066$, $p > 0.05$. The null hypothesis is not rejected. This implies that there was no significant difference in the performance of the students in the various groups before the treatment. In other words, the groups were homogeneous at the beginning of the experiment.

Hypothesis 2: There is no significant difference in the performance mean scores of students in Mathematics in the experimental and control groups before and after the treatment.

Mathematics Performance test in the three groups were compared using Analysis of Covariance (ANCOVA) at 0.05 level of significance. The result is presented in Table 3.

Table 3: Analysis of Covariance of the performance mean score of students by treatment

Source	Sum of Squares	Df	Mean Square	F	Sig
Corrected Model	4215.257	3	1405.086	236.814	0.000
Pre-test (Covariate)	2192.574	1	2192.574	369.538	0.000
Groups	2119.949	2	1059.975	*178.649	0.000
Error	1127.325	190	5.933		
Total	107555.000	194			
Corrected Total	5342.582	193			
R Squared = .789 (Adjusted R Squared = .786)					

p<0.05

Table 3, shows that $F_{(2,190)} = 178.649$, $p < 0.05$. The null hypothesis was therefore rejected. This implies that there was a significant difference between the performance of students in the experimental and the control group. Multiple Classification Analysis was used to determine the effect of the treatment on students' performance in the groups. The result is shown in Table 3.

Table 4: Multiple Classification Analysis (MCA) of Students' performance in Mathematics by treatment.

Grand Mean = 22.95					
Variable + Category	N	Unadjusted Deviation	Eta	Adjusted Deviation	Beta
Control	83	-3.34		-3.44	
Mother Tongue Only	50	0.39	.62	0.47	.63
Mother Tongue as Supplementary medium	61	4.23		4.30	
R				0.888	
R²				0.789	

Table 4 revealed that students exposed to mother tongue as supplementary medium of instruction had the highest adjusted mean score of 27.25 (22.95 +4.30). This is followed by those exposed to mother

tongue medium of instruction only with an adjusted mean score of 23.42 (22.95 + 0.47), while those in the control group had the least adjusted mean score of 19.51(22.95 + (-3.44)). The treatment accounted for 62% (Eta^2 = 0.62) of the observed variance in students' performance and the remaining 38% could be due to errors and other variables.

Hypothesis 3: There is no significant difference in the performance mean scores of students exposed to

Mother tongue as supplementary medium of instruction and those not so exposed.

The performance mean scores of students in the post-test Mathematics Performance test in the three groups were compared using Analysis of Variance (ANOVA) at 0.05 level of significance. The result is presented in Table 4.

Table 5: Analysis of Variance of the post-test performance mean scores of students in the experimental and control groups

	Sum of Squares	Df	Mean Square	F	Sig
Between Groups	2022.683	2	1011.342	*58.184	.000
Within Groups	3319.899	191	17.382		
Total	5342.582	193			

P < 0.05

Table 5 shows that, F$_{(2,191)}$ =58.184, P<0.05. Therefore, the null hypothesis was rejected. This implies that there was significant difference in the performance of students exposed to mother tongue as

supplementary medium of instruction and those not so exposed. To determine the source of difference among the groups, Scheffe Post-Hoc Analysis was carried out as shown in Table 6.

Table 6: Scheffe Post-Hoc Analysis of students' post-test performance mean scores by treatment.

Treatment	Control	Mother Tongue only	Mother Tongue as supplementary medium	N	Mean
Control		*	*	83	19.61
Mother Tongue only			*	50	23.34
Mother Tongue as Supplementary Medium				61	27.18

Table 6 revealed that, there was significant difference in the performance of students exposed to mother tongue only and those exposed to mother tongue as supplementary medium of instruction. Similarly there was significant difference between the performance of students in the mother tongue only, mother tongue as supplementary medium and the control groups at 0.05 level of significance.

IV. Discussion

The results obtained from the analysis revealed that the groups were homogeneous before intervention. It was further revealed from the result that there exists a positive difference in the post-test performance mean score of students exposed to treatment. The result revealed that students exposed to mother tongue as supplementary medium of instruction had the highest mean difference. This indicates that the performance of students exposed to mother tongue as supplementary medium of instruction improved best.

It was revealed from the results, that the performance mean score of students in the experimental group improved after exposure to treatment. This findings corroborates the findings of Fafunwa (1992) that students taught Mathematics in Yoruba performed

significantly better than their counterparts. It was also in line with the findings of Oginni and Owolabi (2013) and Jovem (2014) who concluded that there was significant difference in the performance of students exposed to the use of mother tongue in Mathematics.

Further analysis, however, revealed that there was significant difference in the performance of students exposed to mother tongue only and those exposed to mother tongue and English language, in favour of those exposed to mother tongue as supplementary medium of instruction. This group performed better than their counterparts in the control group and mother tongue only group. This was similar to the submission of Awofala, Awofala, Nneji and Fatade (2012) who submitted that it was not enough to teach science, technology and Mathematics throughout in English. However, the finding contradicts the findings of Abdu (2011) who concluded that students exposed to mother tongue medium of instruction only performed better than those exposed to mixed languages(Hausa and English). The reason for the difference in the findings of the two studies may be due to the fact that both studies were carried out in different ethnic localities (Yoruba and Hausa).

V. Conclusion and Recommendation

The study examined the effects of mother tongue as supplementary medium of instruction on junior secondary schools students' performance in mathematics. The results revealed that mother tongue as supplementary medium of instruction improved the performance of students in mathematics to a large extent. Based on the findings of the study, it was concluded that both "mother tongue only" and "mother tongue as supplementary medium" of instructions were effective media of instruction for the teaching of Mathematics. However, the use of mother tongue as supplementary medium of instruction improved the performance of students in Mathematics to a large extent and thus was adjudge the best. It was therefore recommended that Mathematics teacher should be more flexible and proactive in their choice of medium of instruction during classroom interactions rather than sticking to media of instruction that will not be productive to learners. Mathematics teachers should also make use of mother tongue as supplementary medium of instruction in Mathematics classroom to enhance the performance of their students in the subject.

VI. Suggestion for Further Studies

This study examined the effect of Yoruba (mother tongue) as supplementary medium of instruction on junior secondary school students' learning outcomes in Mathematics. The study should be carried out in other Nigerian local languages in the country.

The study could also include other variables (like school location and others) that are not considered in this study.

References Références Referencias

1. Abdu, A.C. (2011). A Study of Influence of Mother Tongue, Teachers qualification, Gender and Experience on Performance in Primary School Mathematics in Katsina State. *JORIND.* 9(2) 147-154.
2. Abidogun B. A. (2012). Teachers' Experiences of Using Yoruba as Medium of Instruction in Primary Classes: Implications for Learning. An unpublished Ph.D Thesis, University of Pretoria, South Africa.
3. Adenegan, K. E., Raji, S. M. & Adenegan, T. S. (2014). The Use of Yoruba Indigenous Language in the Teaching and Learning of Mathematics in Nigerian Schools. *International Journal of Science and Science Education,* 5(1), 53 – 59.
4. Akinsola M. K. (2005). Mathematics and Language: Any Relationship. In Dada A, Abimbade, A and Kolawole, O.O.(eds). *Issues in Language, Communication and Education,* Ibadan: Constellation Books. 324-331
5. Awofala A.A, Awofala O.A. A, Nneji L. M , & Fatade A.O (2012). The relation between Language and Science, Technology and Mathematics in Nigerian Schools. *International Journal of Mathematics Trends and Technology.* 3(3) 117-24
6. Ayodeji M.A. (2017). *Effects of Mother Tongue as Supplementary Medium of Instruction on Junior Secondary School Students Learning Outcome in Mathematics in Ekiti State.* (An unpublished M.Ed Thesis submitted to the Department of Science Education, Faculty of Education, Ekiti State University, Ado-Ekiti).
7. Bermejo V, Ester P and Morales I (2021) How the Language of Instruction Influences Mathematical Thinking Development in the First Years of Bilingual Schoolers. *Front. Psychol.* 12: 533141. doi: 10.3389/fpsyg.2021.533141
8. Brigit, P. (2007). Language across the Mathematics Curriculum in England. In Sigmud Ongstand(Ed) Language in Mathematics. A Comparative Study of Four National Curricular
9. Durkin, K. (1991). Language in Mathematics Education an Introduction. In Durkin K. & Shire, B(eds) *Language in Mathematics Education,* Milton Keynes: Open University Press.
10. Ejieh, M.U. (2004). Attitudes of Student Teachers Towards Teaching in Mother Tongue in Nigerian Primary Schools: Implications for Planning Language, Culture and Curriculum International Conference: *The Future of Education*, 17(1), 47-54.
11. Fafunwa, A.B (1975). Education in the Mother tongue: A Nigerian Experiment – The Six Year (Yoruba Medium) Primary Education Project. *University of Ife West African Journal of Education.* XIX (2).
12. Fafunwa, A.B, Macauley, J.I and Funso-Sokoya, J.A. (1989). Education in Mother Tongue: The Ife Primary Education Research Project. Ibadan: University Press Limited.
13. Fafunwa, A.B. (1992). Innovations in Nigerian Education: Past, Present and Future. In Ipaye, B (Ed). *Education in Nigeria past, present and future.* Lagos: Macmillan Nigeria. 398-419
14. Federal Repulic of Nigeria (2013). National Policy on Education, Yaba, NERDC Press.
15. Jovem, D.R (2014): Effectiveness of Mother Tongue-Based Instruction On Pupils Achievement In Mathematics. Unpublished Masters Thesis, Central Mindano University, University Town, Musuan, Maramag, Bukidnon, Philippines.
16. Nkonde, E., Siluyele, N., Mweemba, M., Nkhata, L., Kaluba, G. , & Zulu, C. (2018). Evaluating the Impact of Teaching and Learning of Mathematics and Science using Local Language (Language of Play) in Primary Schools in Muchinga Province, Zambia, a Case of Chinsali District. *American Journal of Educational Research*, 6(8), 1153-1163.

17. Oginni O.I and Owolabi, O.T (2013): Effect of Mother Tongue and mathematical Language on Primary School Pupils' Performance in Mathematics. *Journal of Emerging Trends in Educational Research & Policy Studies. JETERAPS* 4(3) 542-546. Retrieved online.

18. Oluwole, S. B. (2014). Don Advocates the Use of Indigenous Languages in Schools. *Online Report (25/12/14) of a Mother Tongue Advocacy Seminar in Abeokuta Nigeria.* http://www.tribune.com.ng/arts-review/item/25060

19. Osungbemiro N. R., Olaniyan, R. F, Sanni R.O. and Olajuyigbe, A.O. (2013). Use Of Indigenous Languages As Media Of Instruction In Teaching Of Biology (A Case Study Of Some Selected Secondary Schools In Ondo West Local Government, Ondo State, Nigeria). *Cambridge Business and Economics conference.*

20. Popoola A. A. (2013). Teachers Level of Understanding the Language of Mathematics as a determinant of Students' Achievement in Mathematics in Nigeria. *Journal of Education and Practice* 4(2)(97-102).

21. Setati, M. (2005): Mathematics Education and Language: Policy Research and Practice in Multilingual South Africa, in Vithal, R. Adler, J. & Keitel, C(eds), *Researching Mathematics education in South Africa,* Cape Town, SA: HSRC.