Impact of Using Tiv Language for Teaching and Learning Mathematics on Students' Achievement in Benue State

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Abstract - *The study was aimed at finding out the impact of using Tiv language in teaching and learning mathematics on students' achievement in the subject. The study covered Education zone B of Benue state. One hundred and fifty-one junior secondary one (JS1) students randomly selected from six secondary schools in the zone were involved in the study. One research instrument, junior school mathematics achievement test (JSMAT) was used for data collection after five weeks of treatment. The reliability coefficient of JSMAT was found to be 0.88 computed using KR_{20}. The experimental group was taught using lesson plans in Tiv language while the control group was taught using lesson plans in English language. The data collected was analyzed using student t-test. Findings from the study showed that the students taught using Tiv language only performed better than those taught using English language only. The findings also showed that the students taught mathematics using Tiv language only in the urban schools performed better than those in the rural areas. From the results of the study it was recommended that the use of Tiv language in teaching mathematics should be encourage by the federal government at the basic education level.*

Keywords: *Tiv, Teaching, Learning, Mathematics and Achievement*.

INTRODUCTION

The problem of poor achievement by Nigerian students in mathematics has been of concern to all mathematics educators in the country. These could be seen in the introduction of different teaching strategies and reforms to arrest the situation which has all been in vain. This is why Odili [1]Uka [2]and Iyekekpolor [3]all agreed that mathematics education in Nigeria is still in a deplorable state at various levels of Nigerian educational system. The achievement of Nigerian students in mathematics both in internal and external examinations has shown a considerable and progressive deterioration. At the school certificate level the West African Examination Council, chief examiners' reports from [4] confirm these observations. The situation seem to be getting worse, up to the point that Nigeria has started taking as low as second to the last position in achievement of students in school certification mathematics examinations among the eleven English speaking West African countries.

Consequent upon the observed deterioration in students' achievement in mathematics the feeling is that several factors contribute to this deterioration. Among these factors are the methods of teaching mathematics, nature and scope of mathematics curriculum, the foundation of students in the subject at primary school level, language of instruction used at the early stages of students' education, students' interest and their inability to retain the concepts learnt among others. It is possible that these factors act jointly or singly to affect students interest and achievement in mathematics. It is also possible that language of instruction in teaching mathematics contributes to students' abysmal achievement in the subject.

In 1951 the United Nations Educational, Social and Cultural Organization (UNESCO) [5] agreed that the best medium for teaching a child is his Mother Tongue (MT). They added that the child learns more quickly through it than through an unfamiliar linguistic medium. In 2003 UNESCO warned that no language can take the place of MT in education and

that no educational system can afford to disregard it without serious detriment to the mental and social development of the child. Also UNESCO position paper on education in multilingual world said that the longer children have their own language as the main medium of teaching, the better they also become in the dominant language, provided of course, that they have good teaching in it [6]. Language is a communication tool through which cultural values, beliefs and knowledge are conceived, negotiated and conveyed from one generation to the other [7]. Two people can understand each other only when they comprehend cues (verbal or non-verbal) they both make. In school, language is both the instrument and the vehicle of teacher-student interaction. The conduct of classroom instruction is inescapably involved in the use and interpretation of language written, printed and above all spoken. Few indeed are the acts of teaching that entail no verbal dimension that proceed without some verbal interplay between teacher and students. Since the act of teaching is an effort to induce learning so is the language of teaching a taproot to learning. From the above statement, one can assert that for a student to achieve better in school he/she must have a good command of the language of teaching and learning. In the case of mathematics students must have good command of the language of instruction (English) and mathematical language.

Bell [8] stressed that mathematics achievement is generally not easy for students learning through their mother tongue (L1) because of the highly specialized mathematical terms with a variation of meaning from those used in every day speech. It is more so difficult for second language (L2) learners because while their L1 counterparts focus on learning the specialized languages they have to first struggle with the English language and thereafter with the mathematical language. Consequently they lag behind. It therefore implies that meeting curriculum standards in mathematics will be disproportionately difficult for Nigerian students who learn the subject in English (their L2) since they will have to perform at much higher cognitive and linguistics levels than their native – speaking peers. This clearly points to the inevitable in-balances between education of those being taught with L1and those being taught with L2, with the later being at a disadvantage.

Cummins [9] shows the difference in basic interpersonal communication skills and cognitive academic language proficiency. To him any language used for academic purpose should be the language which a learner is proficient in it or else the child cannot learn effectively in it. This implies that any language that is used as a language of instruction should be the language that the children are proficient in, to enhance achievement.

From the foregoing, one could infer that Nigerian children, especially those of Tiv extraction, are denied meaningful education at the basic education stage since most of them do not understand the language of instruction at this stage. The performance of students in mathematics is not encouraging. This may be because a large proportion of the pupils do not understand the language of instruction left alone the mathematical language. This makes the children to miss a great deal of the lessons due to difficulty of understanding the language rather than the mathematics content. The situation is worsened because they cannot request for any explanation since they lack the needed expression to do so. At home too, the parents cannot assist the students because they have never been exposed to such a language (English) in their life time. At the end the child fails the course and this is hardly associated to the language problem. It is in line with this that, this study wishes to investigate the impact of using Tiv language for teaching and learning mathematics on JS1 students' achievement in Benue state.

OBJECTIVES OF THE STUDY

The objective of this study is to determine the impact of using Tiv language for teaching and learning on students' achievement in mathematics. Specifically, the study investigates: whether the use of Tiv language for teaching has any impact on students' achievement in mathematics; and if the impact of using Tiv language for teaching mathematics on student achievement is dependent on location.

Research Hypotheses

In order to further guide the study the following hypotheses were formulated and tested at 0.05 alpha levels.

1. There is no significant difference between the mean achievement scores of students taught mathematics using Tiv language only and those taught using English language only.
2. The mean achievement scores of Students in rural and urban areas who are taught mathematics using Tiv language only are not significantly different.

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METHOD

True experimental design was used for the study. Specifically it was a randomized control group pre-test, post-test design. This was adopted because the researchers were combining one treatment with control group, and the fact that the study involves a computation of two independent means. The design was used because there was full randomization of subjects to achieve statistical equivalence of the subjects in all the groups. This was possible as the researchers were using the evening lessons of the sampled schools. The study is termed experimental because it is expected to establish the nature and scope of any cause-effect relationship between the use of Tiv language for teaching and learning of mathematics on students' achievement in the subject. The sampled schools were schools that were found to be statistically equivalent using pair wise compilation of means obtained from pre-test result. The schools were randomly assigned to experimental group (EGP), and the control group (CGP) with the language of instruction being Tiv language only and English language only respectively. The independent variable is the use of Tiv language in teaching and learning of mathematics while the dependent variable is students' achievement in mathematics.

The study was carried out in Zone B of Benue state. The Zone has 7 local government areas with 190 schools which have been approved by government and are taking Junior Schools Certificate Examination with Benue State Examinations Board [10]. The population of the study was all the JS1 students in the schools. Out of which 230 students of Tiv origin from 6 secondary schools were used for the study.

One research instrument Junior School Mathematics Achievement Test (JSMAT) was used to collect data for the study after 5 weeks of treatment was used to test this instrument which was validated by mathematics educators and experts in measurement and evaluation. Kuder-Richardson formula 20 was used to calculate the reliability coefficient of JSMAT which was found to be 0.88. This shows a very high level of internal consistency and hence JSMAT was reliable [11]. The lesson plans for EGP were prepared and presented in Tiv language only, while that of CGP were prepared and presented in English language only. The data collected was analyzed using mean, standard deviation and student t-test.

RESULTS

Table 1 was used to answer the research questions while Tables 2 and 3 were used to test the hypotheses.

Table 1. A summary of the means and standard deviations of students' achievement in Mathematics

Group	Location	N	Mean	Std Deviation
EGP 1	Urban	40	15.53	2.04
	Rural	33	13.39	2.26
	Total	**73**	**14.56**	**2.38**
CGP	Urban	39	7.95	2.20
	Rural	39	8.69	2.28
	Total	**78**	**8.32**	**2.26**

Looking at the data in Table 2, it can be seen that the mean achievement scores of students' in EGP was 14.56 with a standard deviation of 2.38 while that of students' in CGP was 8.32 with a standard deviation of 2.26. With almost the same spread of scores about their mean scores and a difference of 6.24 between the mean scores of the two groups there is a reasonable difference between the mean achievement scores of students in EGP and CGP. This provides answer to research question one.

Table 2: Result of t-test Values per group.

Group	Mean $\bar{x}$	Standard Deviation	N	t_{cal}	Df	t_{crit}	Sig	Mean difference
EGP1	4.56	2.38	73	18.1380	149	1.64	S	6.24
CGP	8.32	2.26	78					

S= Significant NS= Not significant

Table 3: Result of t-test Values per group and location

Group		$\bar{x}$	SD	N	t_{cal}	Df	Sig	Mean difference
EGP1	Urban	15.53	2.04	40	4.205	71	S	2.14
	Rural	13.39	2.26	33				
CGP	Urban	7.95	2.20	39	1.460	76	NS	-0.74
	Rural	8.69	2.28	39				

S= Significant NS= Not significant ; t_{crit} *= 1.6*

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The mean achievement scores of students in urban areas when taught Mathematics using Tiv language only as shown in Table 3 was 15.53, with a standard deviation of 2.04 and that of rural students was 13.39 and a standard deviation of 2.26 in JSMAT. The difference in their mean achievement was 2.14. Which means the urban students achieved higher than the rural students when they were taught mathematics using Tiv language only? This answers research question two.

Table 2, shows the calculated value of t= 18.138 while the critical value of t at 149 degrees of freedom at 0.05 alpha level is 1.6449. The table also shows that the difference is significant at 0.05 alpha levels. With this result the null hypothesis is hereby rejected. This means that there is a significant difference between the mean achievement scores of students taught mathematics using Tiv language only and those taught using English language only. The students taught using Tiv language only performed better than those taught using English language only.

The result in Table 3 shows the calculated value of t= 4.205 for urban and rural students while the critical value of t at 0.05 is 1.6652. The table also shows that the difference is significant at 0.05 alpha level. Hence the null hypothesis is rejected. This implies that there is a significant difference between the mean achievement scores of students in rural and urban areas who are taught mathematics using Tiv language only. The students taught mathematics using Tiv language only in urban schools performed better than those in the rural areas.

DISCUSSION

The result of this study has shown that students taught mathematics in Tiv language had a higher mean achievement score than those taught mathematics using English language only. This finding agrees with that of Ramirez as reported by Tove Skutnable-Kangas [12]. who reported that when students are taught in their mother tongue for a relatively long period of time they have best results in the subjects taught and in general educational achievement. It also agreed with the study by Thomas and Collier [13]. in the USA. Their study shows that students who reached the highest level of school achievement were those whose mother tongue was the main medium, of education for the most extended period of time.

When the mother tongue (L1), was used for a lengthy period in education, it (L1) was the strongest predicator of both the children's competence and gain in second language (L2) and in their school achievement. This study also agrees with the study conducted in Oyo state by Olateju [14] which shows a significant difference in science achievement scores of pupils taught in the mother-tongue compared to those taught in English. The reason for this result is that there is more effective communication between the teacher and the students in the mother-tongue. This is because the child talks, believes and reasons in the mother-tongue.

It was found that urban students achieved significantly higher than the rural students. This finding is in line with Imoko and Agwagh [15], Uloko [16]; O'kwu and Anyagh [17], O'kwu and Aligba [18] all in Benue state and Uka [2] in Abia state and Jahun and Momoh [19] in Kaduna, Kano and Katsina states. They all found that urban students achieved higher in Mathematics than the rural students.

In addition the study found that urban students who are taught mathematics using Tiv language only achieved better than their counterparts who were taught using English languages only. This is because the introduction of Tiv language as a language of instruction attracts their interest more than the English only classes. This rise in interest made them to be more attentive in the classes hence resulting to higher achievement.

CONCLUSION AND RECOMMENDATION

The mean achievement scores of experimental group (14.56) and control group (8.32) was found to be significantly different in favor of the experimental group. There was significant difference in the mean achievement scores of urban students (15.53) and their rural counterparts (13.39) who were taught using Tiv. The results of this study have shown the need for government and other stakeholders to encourage the use of mother tongue (L1) in mathematics at basic education level.

It is recommended that having found mother-tongue to be effective in teaching and learning mathematics, government should enforce the mother-tongue policy and extend it to cover the whole of basic education programme. Teacher training institutions should incorporate instructions in mother-tongue in their teacher training programme so as to produce teachers that will be able to teach all subjects in their mother-tongue at the basic education level. Curriculum developers should develop mathematics curriculum in the mother-tongue for easy planning and

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presentation of mathematics lessons in mother-tongue. Authors and publishers of educational books should endeavor to write and publish mathematics books and other instructional materials in the mother-tongue. Parents should endeavor to speak and encourage their children to speak and study in their mother-tongue to enhance their achievement in all academic subjects.

Limitation of the study

Incessant absenteeism of students especially those in the experimental group could have been possible interferences in the study**.** Since the study was conducted in five weeks not all aspects of mathematics were taught during the experiment. Hence a longitudinal study on the use of Tiv language could be investigated.

REFERENCES

[1] Odili, G. A. (2006). *Mathematics in Nigerian secondary school: A teaching perspective.* Lagos: Anachuma Educational Books.

[2] Uka, N.K. (2006). Teachers' mathematical attitude, ethnomathematics knowledge and primary pupils achievement in mathematics in Abia state-Nigeria. *Unpublishered PhD. Thesis faculty of education, university of calabar.*

[3] Iyekekpolor, S. A. O. (2007). *Corporate strategies for combating poor performance in mathematics.* Onimsi printing press Makurdi.

[4] WAEC, (2006). Chief Examiners' Report (1991-2006). Lagos

[5] UNESCO (1951). *The use of vernacular language in education*. Report of UNESCO meeting of specialists. Paris

[6] UNESCO, (2003) Education in a multilingual world. *UNESCO Education Position paper.* Paris: UNESCO

[7] Kgomotso, G. G. (2008) Language in mathematics education: A double jeopardy for second language learners. Retrieved on June 10th 2010 from www.csupomona.edu.

[8] Bell, B. (2003) *Mother-tongue maintenance and maths and science achievement*: A contribution towards the formulation of multilingual language-in-education polices for South African Schools. Retrieved on December 15th 2010 from http//und.ac.za/und/ling/archive/bell-01.htm

[9] Cummins, J. (2008) *Basic interpersonal communicative skills and cognitive academic language proficiency.* Retrieve from www.iteachilearn.com

[10] Benue state examination board (BSEB) (2010) Students enrolment data school by school.

[11] James, H. M. (1997) *Research in Education: A conceptual introduction.* New York:Addison-Wesley educational publishers inc

[12] Tove Skutnabb-Kangas (2004). Language policies and education: The role of education in destroying or supporting the world's linguistic diversity. *World Congress on Language Policies.* http://www.linguapax.org/congress

[13] Thomas, W. P. & Collier, V. (2002). *A national study of school effectiveness for language minority students' long term academic achievement report*. Project 1:1 Fairfax Virginia: VREDE, George Mason University, url: http://goo.gl/AGjp3H.

[14] Olateju, O. (1991). Mother tongue instruction and pupil's achievement in primary school science. *STAN Proceedings*

[15] Imoko, B. I. & Agwagh, U. N. V. (2006). Improving students' interest in mathematics through the concept mapping technique. A focus on gender. *Journal of research in Curriculum and Teaching 1(1)* 30-37

[16] Uloko, E.S. (2010) effects of peer-facing strategy on achievement retention of learning challenged student in junior secondary school statistics. *Unpolished PhD Dissertation Benue state university makurdi.*

[17] O'kwu, E. I. & Anyagh P. I. (2010). Effect of career-related instruction on students' Mathematics achievement in senior secondary schools in Benue state, Nigeria I*nternational research journal* 1(7) 206-209.

[18] O'kwu, E. I. & Aligba, S. O. (2004). The effects of gender and location on Mathematics achievement of secondary school students in Benue State.*Benue State University Journal of Education (BSUJE)*, 5: 123-126.

[19] Jahun, I. U. & Momoh, J. S. (2001). Environment and sex on mathematics achievement. ABACUS: *The Journal of the Mathematics Association of Nigeria, 26(1)*, 53-58

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