Effectiveness of the Use of Mother Tongue as a Medium of Instruction in Teaching Word Problems on Multiplication of Whole Numbers

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Abstract: This study attempted to determine the effectiveness of mother tongue language in teaching word problems on multiplication of whole numbers. To achieve this aim, the researcher used an experimental research design. The instrument used for gathering data was Math periodical test prepared by the Mathematics Division Coordinators and Master Teachers.. The respondents of the research were grade three pupils in section B and D. To facilitate data analysis and interpretation, the statistical measures used were the mean, standard deviation, t-test for independent sample and t-test of correlated sample. The study determined the effectiveness of the use of Mother Tongue as a medium of instruction in teaching word problems on multiplication of whole number in a specified public elementary school, Marilao, Bulacan. The result of the study revealed that the use of Mother Tongue-Based Language are both effective in teaching problem solving in Mathematics, but the use of Mother Tongue-Based Language is more effective than Non-Mother Tongue-Based Language. Curriculum planners, publishers and textbooks writers should work together with experts in Mathematics, to produce standard text in Mathematics for the pupils' mother tongues to gain its pride of place in schools for better understanding of the subject.

Keywords—Mother Tongue, Teaching Word Problems, Whole Numbers, Mixed method research

1. INTRODUCTION

Language is a manifestation of culture, a wealth of cognitive instruments at the service of thought, a critical instrument for the individual to regulate his own higher cognitive functions and above all, a coherent set of deep meanings for mathematical word problems.

It is through language that we develop our thoughts, shape our experiences, explore our customs, structure our community, construct our laws, articulate our values, and give expressions to our hopes and ideas. The mother tongue is a common language that is freely and comfortably spoken by the adult generation both at home and outside to their neighbors in a community and reflect their culture and ethnic backgrounds. It is how different groups within the society maintain their identities. They do this by using the language in a way which is characteristic of their group and by which they can be identified [1][2].

2. RELATED WORKS

A study opined that language is undoubtedly one of the most important areas of the curriculum [3]. They are both means to an end and an end in themselves. That is, they provide a child with the tools to communicate and at the same time an integral part of the creative process that results from this communication when the language arts are taught with awareness, as well as enjoyment, students gain competence of their language and confidence in themselves.

The uniqueness of mathematics language has distinguished mathematics from other subjects [4]. Anyone that cannot cope with imperial and native language which is based on verbal reasoning may likely get lost easily in quantitative reasoning where the use of mathematics language is necessary. Spatial and mathematical reasoning will help students to generate retain, retrieve and transform well-structured visual images into mathematics appreciation with the aid of mathematics language [5]

Mother Tongue Based Multilingual Education (MTBMLE) is the use of more than two languages for literacy and instruction [6]. It starts from where the learners are and from what they already know. This means learning to speak, read, write and think in their first language or L1 like Cebuano, Tagalog, Ilocano, Waray, etc. and also teaching mathematics, science, health and social studies in the L1.

Bilingual education refers to the practice of teaching non-English-speaking children in their native language [7]. Developed in the 1960's, such program were intended to allow children to progress in subjects such as math, science, and social studies while they learned English in a separate class.

UNESCO supports bilingual and/or multilingual education at all levels of education as a means of promoting both social and gender equality and as key element of linguistically diverse societies. Bilingual and multilingual education refers to the use of two or more languages as mediums of instruction [8].

DepEd Order No. 16, s.2012 focuses on the guidelines on the Implementation of Mother Tongue-Based Multi-Lingual Education (MTB-MLE). As stated in the guidelines, the Mother Tongue-Based-Multilingual Education (MTB-MLE) shall be implemented in all public schools, specifically in Kindergarten, Grades 1, 2 and 3 as a part of K to 12 Basic Education Program. The MTB-MLE shall support the goal of "Every Child-A-Reader and A-Writer by Grade 1." These guidelines are composed of Objectives, Areas of Focus, Teaching and Learning Process, Teachers Training and Development, and Preparation of learning Resources. This program will provide the appropriate guidance and motivation for our teachers to encourage our learners to effectively apply their acquired literacy skills in their practical daily lives [9].

Now with the implementation of the (MTB-MLE) the instruction/learning process would certainly be facilitated and enhanced because following the school textbooks, manuals and aids, all their contents, exercises and questions done in English, Filipino, a bilingual gap is created for some because of the reality of how many dialects and lingua franca are used in the different parts of the nation. A student or pupil would understand the course much easier and have a good chance of retention and mastery when heard in his own local language [10].

The use of the mother tongue as the language in instruction does not hinder learning [11]. An author also stressed that if one talks to a man in a language, he understands that goes to his head, and if one talks to him in one's own language it goes to his heart [12]. He was emphatic in stating that "we cannot gear an entire educational system for the intellectual and economic elite"[13].

3. STATEMENT OF THE PROBLEM

This study determined the effectiveness of mother tongue as a medium of instruction in teaching word problems in mathematics for grade three pupils in an elementary school in Marilao, Bulacan, Philippines during S.Y. 2020-2021. Specifically, it answered the following questions:

1. What are the pre-test scores of the pupils attending classes with and without mother tongue instruction?

2. What are the post-test scores of the pupils attending classes with and without mother tongue instruction?

3. Is there a significant difference in pre-test scores between pupils with mother tongue instruction and pupils without mother tongue instruction?

4. Is there a significant difference in post-test scores between pupils with mother tongue instruction and pupils without mother tongue instruction?

5. Is there a significant difference between the pre-test and post-test scores of pupils without mother tongue instruction?

6. Is there a significant difference between the pre-test and post-test scores of pupils with mother tongue instruction?

4. METHODOLOGY

This study will use experimental design. It is said to be experimental only if the area of focus is being randomly assigned to treatment groups or the control (or the comparison) groups. It is also to test hypotheses by controlling the factors of the experiment to determine or predict an outcome based on independent and dependent variables. Experimental research design provides the framework in which a researcher shapes an experiment.

The experimental group will be exposed to mother tongue approach while the control group will be subjected to conventional approach. The two groups after receiving their corresponding treatment will be given a post test to determine the achievement in the first and second grading period. The population of the study will be all Grade IV pupils with a total of two hundred thirty six (236) pupils of an elementary school in Marilao District School Year 2020-2021. From these, forty-five will be taught using mother tongue approach and forty-five will be taught using conventional approach.

The researcher will modify the Math Achievement Test prepared by the experts, for the Dep-Ed, of Division of Malolos City . It will be 40 item multiple choice type of test divided into four parts according to the four fundamental operations of whole numbers. Each part is composed of 10 items. The Pretest- the test will be given to the pupils before the start of the lessons. The results of the test will be recorded by the researcher. The same test (pre-test) will be administered at the end of the lessons as a post-test.. The researcher also will record the result of this.

To gather data the researcher will administer a pre-test to the two groups of pupils. The results will be encoded accordingly after which each group will taught with a corresponding teaching approach for the identified subject matter. After the teaching, the same test will administered to same group of pupils as post-test and the result are recorded in the same manner.

5. RESULTS AND DISCUSSIONS

Pre-test Scores of The Pupils Attending Two Different Teaching Approaches

It reveals that each group has 45 pupils. For the mother tongue group, the lowest score was 7 and the highest score was 25 with the mean of 14.60 which is slightly heterogeneous. For the conventional group, the lowest score was 5 and the highest score was 25 with the mean of 14.44 and 5.08 of the standard deviation.

Post-test Scores of The Pupils Attending Two Different Teaching Approaches

It reveals that each group has 45 pupils. For the mother tongue group, the lowest score was 11 and the highest score was 37 with the mean of 26.73 which is the above average score of 20. For the conventional group, the lowest score was 10 and the highest score was 28 with the mean 18.78, which is below the average score of 20.

Comparison of Pre-test Scores between Pupils with mother tongue and Pupils without intervention

The data reveals that the t- computed value is -1.43-which is lesser than t-tabulated value using 0.05 level of significance with 88 degrees of freedom. This means that the null hypothesis is accepted and conclude that there is no significant difference between the pre-test scores of the pupils in the class with mother tongue and the class without mother tongue intervention. These findings revealed that the two groups were comparable.

Comparison of Post-test Scores between Pupils with mother tongue and Pupils without intervention

The data reveals that the t-computed value is -6.236 which is beyond the critical value at 0.05 level of significance with 88 degrees of freedom. The null hypothesis is rejected. This means that there is a significant difference between the posttest scores of the pupils in the class with mother tongue intervention and the class without mother tongue intervention. It means that the use of mother tongue is effective considering the result of the post-test of mother tongue which is 26.73 of mean compared to the result of the post-test of the conventional group which is 18.73 of mean.

Comparison between the Pre-test and Post-test Scores of Pupils without mother tongue instruction

The data reveals that the t- computed value of 3.75 is greater than the t- critical value of 0.05 level of significance with 44 degrees of freedom, the null hypothesis is therefore rejected in favor of the research hypothesis. This means that there is a significant difference between the pre-test and the post-test scores of the class with conventional approach.

Comparison between the Pre-test and Post-test Scores of Pupils with mother tongue

The data reveals that the t- computed value of 12.13 is greater than the t- critical value of 0.05 level of significance with 44 degrees of freedom, the null hypothesis is therefore rejected in favor of the research hypothesis. This means that there is a significant difference between the pre-test and posttest scores of the class with mother tongue. The result shows that the mother tongue group did much better in the post-test.

6. CONCLUSIONS

Based on the findings of the study, the researcher arrived at the following conclusions:

. Since data revealed that the use of mother tongue is effective. Therefore, word problems using mother tongue could be taught as an activity, enrichment, drill and/or practice. This makes the learning challenging yet motivating experience among different levels, schools, district, and division, and hence, highly necessary in teaching Mathematics subject.

7. RECOMMENDATIONS

Anchored on the preceding findings and conclusions, it is recommended that school administrators and supervisors may instruct teachers to implement the use of mother tongue in teaching and learning mathematics and to promote mother tongue during celebration of language month.

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