

The Extent of Use of the MTB-MLE in Teaching Grade 3 Mathematics and Its Effect on the Performance of the Pupils

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Abstract

The study aimed to identify the extent of use of the MTB-MLE in teaching Grade III Mathematics and its perceived effect on the performance of the pupils. The school covered in this study was Ayungon District's Public Elementary Schools. Respondents were the 38 teachers handling Grade 3 classes. The following statistical tools were used in the analysis of data: frequency, percentage, weighted mean, Cronbach's α (alpha) and Spearman Rank Correlation Coefficient. Findings revealed that majority of the teachers handling mathematics were non-master's degree holder and most of them have been teaching for 6- 10 years and all of them have attended relevant trainings in K to 12 instruction. Moreover, most of the pupils obtained a "Fairly Satisfactory" grade in Math in the second grading period. It was also found that a "very weak" relationship exists between the extent of use of MTB-MLE practices in teaching Mathematics in the following areas: teacher practices in using the language, instructional materials, strategies in teaching mathematics, assessment and evaluation and parents' involvement in relevant activities with their academic performance. Furthermore, it was found that there is a weak relationship between the teachers' profile and the extent of use of MTB-MLE in teaching Mathematics. In general, a relationship was found "very weak" between the use of MTB-MLE in teaching Mathematics and its perceived effect on pupils' academic performance.

Keywords: *Mother Tongue-Based Multilingual Education, Language of Instruction, strategies, practices*

I. INTRODUCTION

Local and international studies have validated the superiority of the use of the pupils' mother tongue or Language 1 (L1) in improving academic performance at the same time promoting Education For All (EFA) (Dep Ed Order No. 74, s.2009).

Mother Tongue-Based Multilingual Education known as MTB-MLE is the effective use of more than two languages for literacy and instruction. It is an institutionalized fundamental educational policy program in the Department of Education from pre-school to Grade 3. Multilingual Education has affirmed benefits such as learners learn to read more quickly in their first language (L1); when they can speak and read in their L1, learning to speak, read and write in L2 or L3 is easy; and they acquire academic competencies more quickly.

In his study, Nolasco (2010) pointed out that while Multilingual Education is an innovative approach to learning, there is a need for the development of good curriculum, training of teachers in the required languages for content and methodology, production of appropriate and relevant instructional materials, and empowerment of the community. He said Multilingual Education would not work when a teacher simply changes the language by translating existing materials into the local languages.

As Mathematics is one subject that pervades life at any age and in any circumstance. Thus, its value goes beyond the classroom and the school. Mathematics as a school subject, therefore, must be learned comprehensively and with much depth (K to 12 Curriculum Guide).

Primary school teachers can make use of the children's indigenous culture and the richness of their mother tongue as an effective medium in teaching mathematics following the MLE framework of listening, speaking/counting, reading and writing/solving. The mother tongue bridges not only to learn the language but also to build a strong mathematical foundation that can be used for lifelong learning in mathematics (Toquero, Ernesto, 2010).

According to Domingo (2010), in order for mathematics education to be relevant in the 21st century, it must offer an integrated and comprehensive view of the world. Math should be viewed from many different perspectives to help pupils overcome the fear of what they may have perceived to be difficult. There are illustrative examples in the mathematical concepts involved in dances, regional songs, stories, poetry and indigenous games. Activities using movement and rhythm can make learning more fun. Engaging the children in their mother tongue while studying math creates spontaneity and reduces math anxiety.

In the same manner, teachers as front liners of change and have a big impact in the success of any educational endeavor at all levels and most especially in the realization of the objectives of the K-12 Basic Education curriculum, they must see to it that they know how to maximize their time in inculcating the knowledge that their learners need to acquire in the classroom and go far beyond in dispensing information to them. More importantly, as teachers teaching in math being the focus of this study, they should know the importance of teaching students to learn math. It could be because the mathematical procedures that are taught in schools will be useful to students later or it could be that they want to expose students to different ways of thinking about the world in which teachers are more concerned with learning mathematics as a way of thinking and knowing. Moreover, they want students to learn transferable problem solving skills in order to promote the likelihood that students will be able to transfer what they learn to other areas and they want students to realize and see the beauty and elegance of mathematics as they grow up.

For a sustainable and successful MLE program, there has to be culturally-sensitive and quality instructional or learning materials. The development of these materials is very important and should be appropriate to the needs, interests and abilities of the intended learners. The materials should reflect the learners' culture, true to their context and relevant to their situation (Casquite 2010). Instructional materials are everything-books, modules, activity sheets, games, field trips, films, and techniques, assessment tools- that teachers use to affect meaningful, purposeful and productive learning of pupils.

While there is a vast literature on the effectiveness of MLE, it is noteworthy to study how the teachers use MLE in the multilingual classrooms. Hence, this study aims to explore the pupil's math performance while teacher uses multilingual instruction in teaching mathematics.

II. METHODOLOGY

Research Design

The research utilized the descriptive-correlational method. It is descriptive since it identified extent practices using MTB-MLE Instruction in relation to Grade 3 Pupils' Math Performance and correlational since these commendable practices would be correlated to the class academic performance of the pupils. In the same way, the relationship between the profile of the teachers and their practices was also identified.

Research Environment

The place of this study is in the Municipality of Ayungon, Negros Oriental. This town is located 81 kilometers north of Dumaguete. Ayungon is a coastal municipality composed of 24 barangays. This town is one school district headed by a district Supervisor. Basically, the town is an agricultural area. Small – scale farmers have their rice fields, corn farm, and other root crops as their main sources of living. They also have livestock to augment their income.

Some are working in commercial establishments in the municipality. Those in the coastal areas are into fishing and other livelihood for the fisher folks in which they can eke out for living. Few of the residents are working in big cities and even abroad.

Research Respondents

The respondents in this study were the 38 elementary Grade 3 teachers from the different schools of Ayungon district.

Research Instruments

This study used questionnaire which was specifically designed for the purpose of this study. It undergone some modifications and refinements to suit with the intended purpose of this work. The researcher also read books, articles, publications, previous studies and other related materials regarding mother tongue – based instruction. Suggestions and pieces of advice from the experts were carry out regarding the items to be included in the questionnaire to ensure content validity. The researcher consulted a panel of experts and thereafter conducted a dry run to find out if the items were valid. The Cronbach's alpha test value was calculated to verify the internal consistency reliability coefficient of the items. The following results are presented such as in teachers' extent of use in language has 0.764, use of strategies in teaching Math has 0.902, use of instructional materials 0.896, assessment and evaluation techniques has 0.874 and parents' involvements in relevant activities has 0.706. With the said result, validity of the questionnaire was properly observed. Moreover, the researcher asked permission from the public schools district supervisor and principals/school heads for the distribution of the questionnaire to the teachers-respondents. Thus, the entire questionnaire was presented to some experts in English for cross checking of grammars and other necessary items aligned with the specific problems of the study.

Research Data Gathering Procedure

The researcher made a formal letter of request for the distribution of the final questionnaires. This was signed by the dean of the Graduate School and approved by the Schools Division Superintendent in the Division of Negros Oriental. The endorsement and approved letter of request was presented to the Public Schools District Supervisor and to the respondents for formal permission regarding the distribution of the questionnaire. She covered the Grade 3 teachers in the elementary level of Ayungon District. During the distribution, she personally explained to the respondents the purpose of the research, monitored and administered the distribution of the questionnaires. Lastly, the math grades of the pupils were gathered with the permission of the principals/school heads and the teachers as well.

III. RESULTS AND DISCUSSION

This section presents the result of the study and provides in-depth analysis and interpretation of data.

Table 1. Highest Educational Attainment of the Teachers

| Educational Attainment | Frequency | Percent |
|-------------------------------|------------------|----------------|
| With Master’s Degree | 2 | 5.26 |
| With Master’s Degree Units | 17 | 44.74 |
| Bachelor’s Degree | 19 | 50.00 |
| Total | 38 | 100.00 |

Table 1 shows that 50% of the teachers are only Bachelor’s Degree Holder and only 44.74% have Master’s Degree Units while 5.26% are with Master’s Degree. The finding shows that most of the teachers has not pursued further studies.

The result conforms to the study conducted by Charanchi (2000) wherein it was revealed that during early 2000, only few teachers aspire to enroll graduate studies. Another study of Oguntebi (2002) revealed that teachers specially the older ones do not wish anymore to go further study.

Table 2. Length of Teaching Experience of the Teachers

| Number of Years | Frequency | Percent |
|------------------------|------------------|----------------|
| 1 – 5 | 8 | 21.05 |
| 6 – 10 | 15 | 39.48 |
| 11 – 15 | 6 | 15.79 |
| 16 – 20 | 9 | 23.68 |
| Total | 38 | 100.00 |

Table 2 shows the length of teaching experience of the teachers. The findings show that 39.48% of teachers have 6 to 10 years’ experience in teaching Mathematics. The researcher considers them as teachers who have already adjusted in the teaching process and its system, practiced the acquired skills needed in their chosen field, experienced the trainings and used strategies that are useful in their teaching. Teaching experience of 16 to 20 years has 23.68%. Moreover, 21.05% of teachers have teaching experience of 1 to 5 years, technically an adjustment period for teaching and researcher considers them as neophyte. While, 15.79%, have 11 to 15 years teaching experience.

In connection with this result, the study of Topia entitled “The Performance Ratings of the Public Elementary School Administrators and Teachers in the Division of Negros Oriental: In Relation to Selected Variables” revealed that most of her teacher respondents spend almost 5-10 years in the teaching profession.

Table 3. Relevant Trainings Attended by the Teachers in the Last Three Years

| Specialization | Frequency | Percent |
|---|-----------|---------|
| Mass Training of Teachers on K-12 Curriculum | 35 | 92.11 |
| Mother Tongue as Medium of Instruction | 26 | 68.42 |
| Teaching Strategies for Mother Tongue Instruction | 24 | 63.16 |
| Framework of K-12 Program | 33 | 86.84 |

Table 3 illustrates the relevant trainings attended by the teachers in the last three years in relation to K to 12 program. Based on the data, 92.11% attended the mass training of teachers on K to 12 curriculum, while 86.81% attended trainings on framework of K to 12 programs. The researcher perceives that these two relevant trainings are the introductory trainings that are necessary in realizing the K to 12 curriculum and its goals. On the other hand, 68.42% attended trainings on mother tongue as medium of instruction and 63.16% attended the teaching strategies for mother tongue instruction. The researcher believes that these two are the core teaching skills that a teacher must acquire, however the result implies that 14 of the respondents was not able to attend the most important training on the teaching strategies for MTB-MLE instructions.

This result is supported by the study of Benson (2012) which found out that the main challenges of the implementation of the MTB-MLE is the willingness of the teachers in attending the trainings intended for MTB-MLE instructions. He further noticed that during the preliminary implementation of MTB-MLE only few teachers attended trainings prepared by both the national and regional DepEd office.

Table 4. Extent of Use of the Sinugbuanong Binisaya in Teaching Mathematics (Part B)

| Practices in Using the Language | Weighted Mean μ | Verbal Description |
|---|---------------------|--------------------|
| 1. I translate the terms not understood in English to the language pupils could understand in Tagalog or Sinugbuanong Binisaya. | 4.61 | Almost Always |
| 2. I shift from one language to another Sinugbuanong Binisaya to Tagalog to English) as the needed arises. | 4.26 | Almost Always |
| 3. I modify the language in the textbook by using conversational Sinugbuanong Binisaya. | 4.13 | Often |
| 4. I use my language of instruction in constructing my pupils' tests or exams. | 4.05 | Often |
| 5. I allow my pupils to count in English then translate in Sinugbuanong Binisaya. | 3.89 | Often |
| 6. I teach in English then translate in Sinugbuanong Binisaya. | 3.79 | Often |
| 7. I use code switching/mixing in explaining the concepts in Mathematics. | 2.84 | Sometimes |
| Composite | 3.94 | Often |

Legend:
 Almost Always = very high
 Often = high
 Sometimes = fair
 Rarely = low
 Almost never = very low

Extent of Use of the Sinugbuanong Binisaya in Teaching Mathematics (Part B)

Table 4 presents the teachers' extent of use of MTB-MLE in teaching Mathematics. Among the practices enumerated, most of the teacher almost always translate the unfamiliar terms in Sinugbuanong Binisaya and almost always shift from one language to another (Sinugbuanong Binisaya to Tagalog to English) as the need arises as reflected on its weighted means 4.61 and 4.26 respectively. On the other hand, some practices presented on the table above are often used by the teachers which include modifying the language in the textbook by using conversational Sinugbuanong Binisaya, using language instruction in constructing pupils tests or exam, and allowing pupils to count in English then translate in Sinugbuanong Binisaya with weighted means of 4.13, 4.05, 3.89 and 3.79 respectively. This indicate that the extent of use of MTB-MLE as enumerated above is "high" because they often use these practices in teaching Mathematics.

This result conforms to the study of Danbolt (2011) wherein he cited challenges in teaching Mathematics using MTB-MLE. He found that teachers handling Math subject in primary level often translate the terms in the language that pupils could understand. They do switching of language in explaining the concepts.

Extent of Use of the Sinugbuanong Binisaya in Teaching Mathematics (Part C)

Table 5 presents the strategies in teaching Math. Most of the teachers almost always teach pupils with the necessary strategies and practices that enable them to meet their needs and abilities. They always carry out their Mathematics lessons by presenting lessons from real life; concrete objects to abstract; giving activities that are interesting and enjoyable that require direct manipulation of concrete objects emphasizing understanding, meaning, as well as skill development; developing concepts through matching, identification, naming objects and naming pictures of objects stressing accuracy. On the other hand, results also reveals that giving modular activities and seat works and encouraging accurate thinking and problem solving were often done by most of the respondents, they sometimes perform outdoor activities and never carry out their Mathematics lessons by allowing pupils to access online games inside the classroom due to no access of internet in t school. The respondents' answers prove that teachers employ various strategies and practices in teaching Mathematics that would contribute on the performance of the pupils. As Domingo (2010) said Math should be taught in different ways and teachers must employ variety of strategies to help pupils overcome the fear of what they may have perceived to be difficult. There are illustrative examples in the mathematical concepts involved in dances, regional songs, stories, poetry and indigenous games. Activities using movement and rhythm can make learning more fun.

Table 5. Extent of Use of the Sinugbuanong Binisaya in Teaching Mathematics (Part C)

| Strategies in Teaching Math | Weighted Mean μ | Verbal Description |
|--|---------------------------------------|---------------------------|
| 1. I teach by modelling and by demonstrating. | 4.68 | Almost Always |
| 2. I present lessons from real life concrete objects to abstract. | 4.63 | Almost Always |
| 3. I emphasize understanding, meaning as well as skill development. | 4.61 | Almost Always |
| 4. I encourage mastery of skills through drills and adequate exercises. | 4.61 | Almost Always |
| 5. I teach Math in the context of day to day lives of the children. | 4.53 | Almost Always |
| 6. I give activities that are interesting and enjoyable that requires direct manipulation of concrete objects. | 4.53 | Almost Always |
| 7. I develop concepts through matching, identification, naming objects and naming pictures of objects. | 4.47 | Almost Always |
| 8. I encourage accurate thinking and problem solving. | 4.45 | Almost Always |
| 9. I employ interactive learning through question and answer. | 4.45 | Almost Always |
| 10. I encourage peer tutoring. | 4.26 | Almost Always |
| 11. I use cultural concepts to teach basic concepts in math. | 4.18 | Often |
| 12. I stress accuracy in the manner of solving problem. | 4.13 | Often |
| 13. I employ collaborative/cooperative activities through puzzles and problem situations. | 4.08 | Often |
| 14. I encourage my pupils to give situations for problem solving in Math. | 4.00 | Often |
| 15. I give modular activities and seatwork. | 3.97 | Often |
| 16. I clap when counting with the children. | 3.95 | Often |
| 17. I integrate Mathematics in other subject areas. | 3.87 | Often |
| 18. I teach number concepts through songs and rhymes in local culture. | 3.84 | Often |
| 19. I do outdoor Math with my pupils. | 3.16 | Sometimes |
| 20. I allow my pupils to do online games in Math inside the classroom. | 1.66 | Almost Never |
| Composite | 4.10 | Often |

Legend: Almost Always = very high
 Often = high
 Sometimes = fair
 Rarely = low
 Almost never = very low

Table 6. Extent of Use of the Sinugbuanong Binisaya in Teaching Mathematics (Part D)

| Use of Instructional Materials | Weighted Mean μ | Verbal Description |
|--|---------------------|--------------------|
| 1. I use counters like bundled sticks, straws, stones, seeds, etc. | 4.76 | Almost Always |
| 2. I use flashcards. | 4.76 | Almost Always |
| 3. I use children’s textbook. | 4.68 | Almost Always |
| 4. I use place value chart. | 4.66 | Almost Always |
| 5. I give board work after discussing the lesson. | 4.63 | Almost Always |
| 6. I provide cut-outs and pictures. | 4.61 | Almost Always |
| 7. I provide number cards. | 4.58 | Almost Always |
| 8. I prepare “Show me cards”. | 4.45 | Almost Always |
| 9. I give exercises written on charts. | 4.45 | Almost Always |
| 10. I provide work sheets/activity sheets. | 4.26 | Almost Always |
| 11. I prepare teacher made exercises. | 4.24 | Almost Always |
| 12. I use building blocks. | 4.03 | Often |
| 13. I use modules in my class. | 2.79 | Sometimes |
| 14. I photocopy children’s textbook. | 2.55 | Rarely |
| 15. I use old textbooks written in English. | 2.53 | Rarely |
| 16. I use LCD projector. | 1.63 | Almost Never |
| Composite | 3.98 | Often |

Legend: Almost Always = very high
 Often = high
 Sometimes = fair
 Rarely = low
 Almost never = very low

Table 6 the extent of use of MTB in teaching Mathematics on the use of instructional materials. Most of the teachers “almost always” use the teaching aids necessary for the learners to visualize the topics presented like: The use of flash cards, textbooks, value chart, number cards, worksheets, and other board work activities. While, they rarely use photocopy and books written in English in teaching Mathematics. On the other hand, they seldom use the LCD projector in presenting mathematics lesson. Data above implies that teachers have “high” extent of use of MTB-MLE instructions in teaching Mathematics with regard to different instructional materials in teaching Mathematics to achieve meaningful and effective learning.

In line with the result, the study of Panzo (2012) pointed out that the most common use of teaching aids is to support a “live” teacher in the classroom. Many teachers use appropriate instructional media in teaching mathematical concepts. They designed IMs supplements to textbook. They include teacher’s manual, skills books or exercise books, workbooks, test questions, transparencies, lesson guides, reinforcement activities, bulletin boards ideas, computer software, and audio/video CDs. Moreover, textbooks are also frequently used by almost all teachers a main source of information.

Table 7. Extent of Use of the Sinugbuanong Binisaya in Teaching Mathematics (Part E)

| Assessment and Evaluation Techniques | Weighted Mean μ | Verbal Description |
|--------------------------------------|---------------------|----------------------|
| 1. Giving of paper and pencil test | | |
| a. periodical test | 4.89 | Almost Always |
| b. formative test | 4.87 | Almost Always |
| c. summative test | 4.79 | Almost Always |
| d. diagnostic test | 4.47 | Almost Always |
| 2. Oral recitation | 4.79 | Almost Always |
| 3. Group work | 4.61 | Almost Always |
| 4. Performance test | 4.24 | Almost Always |
| 5. Teacher observation | 4.18 | Often |
| 6. Portfolio assessment | 4.13 | Often |
| 7. Use of rubrics and rating scale | 4.08 | Often |
| Composite | 4.51 | Almost Always |

Legend: Almost Always = very high
 Often = high
 Sometimes = fair
 Rarely = low
 Almost never = very low

As can be gleaned from Table 7, majority of the teachers “almost always” utilize paper and pencil test for formative, summative, periodical test, diagnostic, pre and post- tests. They also give group work, and performance tests. Over-all, the respondents “almost always” use the assessment and evaluation techniques provided using the Sinugbuanong Binisaya in teaching Mathematics with a composite mean of 4.51. This denotes that many teachers employ conventional assessment and evaluation techniques in validating learning in their Mathematics classes. The finding also reveal that the teacher try to use assessment tools appropriate and suited to the abilities of their pupils. Thus, it implies that the extent of use of MTB in assessment and evaluation practices is generally “high.” They believe that these assessment methods are ways of ensuring that pupils’ performance are being evaluated properly and appropriately.

In Ojastro’s (2011) study entitled “Mathematics Assessment Practices of Grade Six Teachers in Relation to Pupils’ Mathematics Performance in the National Achievement Test,” he found that, “teach-test” principle clearly imposes on teachers the need for assessment to get feedback on the effectiveness of the instruction they employed. Moreover, he added that assessment today is an integral part of teaching. It has a very significant role in the success of instruction. It serves as a means to document students’ performance, guide, improve and provide opportunities for instruction and convey information and expectations to students, parents and other concerned individuals for their educational growth and development. It is believed that good assessment practices will result to a better instruction, which in turn will warrant better performances of students.

Hence, he firmly believed that assessment is an integral part in instruction. Through assessment, teachers will be given an immediate feedback on their teaching efficiency and efficacy and they would likewise communicate to their students’ performance based on the expected level of proficiency.

Table 8. Extent of Use of the Sinugbuanong Binisaya in Teaching Mathematics (Part F)

| Parents' Involvement in Mathematics in Relevant Activities | Weighted Mean μ | Verbal Description |
|--|---------------------|--------------------|
| 1. I encourage parents to monitor the performance of their children in school. | 4.53 | Almost Always |
| 2. I invite parents in school as the need arises. | 4.34 | Almost Always |
| 3. I schedule meetings for parents to discuss children's academic performance every grading period. | 4.32 | Almost Always |
| 4. I give assignment/homework during weekdays so that parents could also be aware of their children's lessons. | 4.13 | Often |
| 5. I involve parents in preparation and production of instructional materials. | 2.08 | Rarely |
| Composite | 3.88 | Often |

Legend: Almost Always = very high
 Often = high
 Sometimes = fair
 Rarely = low
 Almost never = very low

Table 8 presents the parents' involvement in Mathematics in relevant activities. As can be seen above, teachers handling mathematics "often" involve parents in relevant activities in teaching the mathematics subject. The composite mean of the enumerated parents' involvement in relevant activities related to Mathematics is 3.88 or "Often." Data implies that teachers involve parents in relevant activities in their teaching of Mathematics is "high." Education of children is made more meaningful and significant if both parents and teachers do their utmost best to create an atmosphere where they can have an open interaction on guiding their children towards a better, productive school life. This supports what Deles (2002) found out on her study entitled "Parents' Extent of Participation in the PTA in Relation to Pupils' Academic Performance," she noted that the role of parents as partners with schools and teachers in the education of their children is greatly high. As their children's first teachers, parents "often" help their children's assignments, projects and other school related requirements. Further, she noted that "often times" teachers encourage parents to monitor the performance of their children and "often" invite conferences for feedback purposes.

Table 9. Summary Table of Extent use of MTB-MLE Used by the Teachers in Teaching Mathematics

| Practices | Weighted Mean μ | Verbal Description |
|--|---------------------|--------------------|
| 1. Practices in Using the Language | 3.94 | Often |
| 2. Strategies in Teaching Mathematics | 4.10 | Often |
| 3. Practices in the Use of Instructional Materials | 3.98 | Often |
| 4. Assessment and Evaluation Practice | 4.51 | Almost Always |
| Parents' Involvement in Mathematics Instruction | 3.88 | Often |

Legend: Almost Always = very high
 Often = high
 Sometimes = fair
 Rarely = low
 Almost never = very low

Table 9 presents the extent use of MTB-MLE in teaching Mathematics. It reveals that the extent of use of assessment and evaluation techniques is “very high” or almost always as reflected on its weighted mean of 4.51, while the strategies in teaching mathematics is “high” or often used by the teachers with a weighted mean of 4.10. The other practices such as the use of instructional materials, use of language and parent’s involvement in mathematics instruction are also “high” or often used by the teachers with weighted means of 3.98, 3.94 and 3.88 respectively.

Additionally, this shows that MTB-MLE alone cannot achieve its goals without pedagogical skills of teachers. Teachers must ensure that the use of “real-world” contexts for teaching mathematics maintains a focus on mathematical ideas. It should be taught using multiple strategies, however, the teacher is responsible for selecting the strategies appropriate for a specific concept.

The result conformed to the study of Daro (2006) entitled “Performance of U.S students in Mathematics”. He traced that the method used by the teachers teaching math at the elementary level is “high”.Further, teachers“often times” created various assessment and evaluation practices for the better understanding of the pupils. He also found out that parents’ involvement on children’s academic performance is moderate.

Table 10. Performance of the Pupils in Mathematics

| Number of Years | Verbal Equivalent | Frequency | Percent |
|------------------------|--------------------------|------------------|----------------|
| 85%-89% | Very Satisfactory | 2 | 5.26 |
| 80%-84% | Satisfactory | 13 | 34.21 |
| 75%-79% | Fairly Satisfactory | 23 | 60.53 |
| Total | | 38 | 100.00 |

Overall Average Academic Performance = 79.47 (Fairly Satisfactory)

Table 10 shows the pupils’ performance in Mathematics in the second grading. Results reveal that 23 or 60.53% of the respondents got a “Fairly Satisfactory” grade in Mathematics. Secondly, 13 or 34.21% got “Satisfactory” grades that range from 80%-84%, and only 2 or 5.26% got a “Very Satisfactory” grade that range from 85%-89%. This implies that most of the respondents got a “Fairly Satisfactory” average in most of their Grade 3 Mathematics in the second quarter, which includes the topics on understanding of multiplication and division of whole numbers including money in mathematical problems and real life situations.

Furthermore, average performance of the pupils in Mathematics implies that the students at this level possess the minimum knowledge and skills and core understandings, but need help throughout their performance of authentic task.

Table 11. Relationship between the extent of use of MTB-MLE s in teaching Mathematics and their academic performance

| Variables Being Paired to Pupils' Academic Performance | r_s | Degree of Relationship |
|---|----------------------|-------------------------------|
| Practices in Using the Language | 0.028 | Very Weak |
| Strategies in Teaching Mathematics | 0.072 | Very Weak |
| Instructional Materials | 0.033 | Very Weak |
| Assessment and Evaluation Techniques | 0.018 | Very Weak |
| Parents' Involvement in Relevant Activities | 0.016 | Very Weak |

Legend: Value of r Strength of Relationship (Statistical Correlation, 2009)

| | |
|--------------------------|--------------------------|
| Between ± 0.50 to ± 1.00 | - strong relationship |
| Between ± 0.30 to ± 0.49 | - moderate relationship |
| Between ± 0.10 to ± 0.29 | - weak relationship |
| Between ± 0.01 to ± 0.09 | - very weak relationship |

The data in Table 11 indicates that the following areas in determining the extent of use of MTB-MLE in teaching Mathematics are factors that affect their teaching performance are significantly related to the their academic performance of the pupils namely: teacher practices in using the language, instructional materials, assessment evaluation techniques and parents' involvement in relevant activities. However, the degree of relationship is very weak which denotes that these factors are not strong predictors of pupil's mathematics performance. Hence, the value of this study is still considerable as significant because it expresses collective perception of teachers of Grade three and it is also very weak since this is how this factors are perceived by the teacher in using MTB-MLE instruction in their Math class.

The other variables show a very weak relationship with the pupils' performance however, the respondents view has almost nothing to do in relation with their academic performance however, they view that the teacher practices in using the language is also imperative in improving the academic performance of Mathematics.

Furthermore, the finding means that the teachers' practices in teaching Math using MTB-MLE pupils' is not considered as determinant to the academic performance of the pupils and because everything depends on the capability of the child as to how he performs and cope with the lesson. Teachers then are just facilitators of learning where it is their role to make mathematics interesting and worth taking.

This conforms to the of study of Ojastro (2011) wherein he found out that the extent of use of instructional materials, varied strategies and activities in teaching mathematics are significantly related to the pupils' performance.

Moreover, the study of Gregorio (2009) affirmed that effective use of interactive strategies in teaching mathematical concepts directly affect students' academic achievements.

Table 12. Relationship between Teachers’ Profile and Their Extent of Use of MTB-MLE in Teaching Mathematics

| Teachers’ Profile and Their Extent of Practices | r_s | Degree of Relationship |
|--|-------|---------------------------|
| Highest Educational Attainment | 0.115 | Weak |
| Length of Teaching Experience | 0.110 | Weak |
| Number of Trainings Attended | 0.168 | Weak |

Legend:

| Value of r | Strength of Relationship (Statistical Correlation, 2009) |
|----------------------------------|--|
| Between ± 0.50 to ± 1.00 | - strong relationship |
| Between ± 0.30 to ± 0.49 | - moderate relationship |
| Between ± 0.10 to ± 0.29 | - weak relationship |
| Between ± 0.01 to ± 0.09 | - very weak relationship |

Table 12 presents the relationship between the teachers’ profile and their extent of use of MTB-MLE in teaching Mathematics. It shows that there is a weak relationship between the profile of the teachers and their extent of use of MTB-MLE in teaching Mathematics. This means that teachers (a) with baccalaureate degree or with MA units/degree, (b) novice or experienced, and (c) attended more or less trainings have almost the same practices in teaching Mathematics using MTB-MLE. This may also imply that the highest educational attainment and the length of teaching experience won’t give a higher degree of relationship it is because MTB-MLE instruction was implemented only in 2013, and with this, the teachers who are new and have been in the teaching for a longer time more or less used the same knowledge on the approaches, strategies and practices upon the implementation of the MTB-MLE instruction.

Hence, Table 12 represents a very alarming relationship between teachers’ profile and their extent of practices. It implies that further studies including master courses and training has not improved their teaching skills in Mathematics using MTB-MLE. Furthermore, it denotes that there is a gap between the courses and trainings’ content towards MTB-MLE and all its related aspects. Teachers are still in the process of adapting new changes in the curriculum. Although teachers are fully equipped with various trainings, exposed to professional growth and had been in the service for many years would not guarantee that the knowledge they acquire are applicable to what the new curriculum offers or would not guarantee that they are already expert in the MTB-MLE instruction.

Based on the study of Tundag (2014), she affirmed that the curriculum in the graduate studies has been used for over a decade and might not include specific areas on how the K-12 must be implemented, however she further believed that graduate studies have subjects that focus on classroom strategies and these may help the teachers in imparting the mother tongue instruction. On the other hand, she revealed that bigger percentage of the teachers might have vast experiences in teaching Mathematics but since this is the third year in the implementation of the K to 12 program wherein the Mother Tongue is used as medium of instruction in teaching Mathematics, most of them are still greenhorns.

Although, trainings relevant to K to 12 is very limited but as teachers being molders of young minds, they need to continue to live by the different principles as to how they can impart and possess information that are applicable to the learners. As what Charanchi (2000) stressed out that continuous training and mastery of the subject is an absolute necessity for effective teaching.

Thus, Gregorio (2009) in his study cited that it is not sufficient to be a graduate in any Teacher Education Institution or a college, or to stand high in the profession of teaching, but like the pupils, the teacher must grow, and this growth could be attained by attending professional training and pursuing further studies.

IV. CONCLUSIONS

Based on the findings above, the following conclusions are hereby drawn;

1. Majority of the teachers handling mathematics are non-master's degree holder and most of them have been teaching for 6- 10 years and all of them attended the relevant trainings in K to 12 instruction. Most of them used Sinugbuanong Binisaya in teaching Mathematics subject.
2. The extent of use of MTB-MLE in teaching Mathematics is "high" on the following areas: teacher practices in using the language, strategies in teaching Mathematics, use of instructional materials and parents' involvement in relevant activities. While, on the use of assessment and evaluation technique is "very high" (almost always)
3. Most of the pupils got "Fairly Satisfactory" grade during their second grading in Mathematics.
4. There is a "very weak" relationship between the extents of use of MTB-MLE in teaching Mathematics on the following areas: teacher practices in using the language; instructional materials; strategies in teaching mathematics; assessment and evaluation and parents' involvement in relevant activities and their academic performance.
5. There is a "weak" relationship between teachers' profile and their extent of use of MTB-MLE in teaching Mathematics.

In general, there is a "very weak" relationship between the use of MTB-MLE in teaching Mathematics and its perceived effect on pupils' academic performance.

V. RECOMMENDATIONS

In the light of the findings and conclusions drawn, it is recommended that:

1. Teachers who are teaching Mathematics are encouraged to use English as an auxiliary language most especially in discussing mathematical concepts which have unfamiliar mother tongue equivalents language.
2. The school administrators and supervisors which include the Public Schools District Supervisors, District-In-Charge, Division Education Program Supervisors are encouraged to intensify the evaluation of teachers teaching Math in order to ensure that they apply their learnings in seminars and trainings as well as their further studies likes Masters' or Doctors' Degree.
3. Experimental study on MTB-MLE and English language in teaching Mathematics must be conducted to verify which language is more effective to use in teaching Mathematics.

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A Questionnaire
on
The Use of Mother Tongue Based- Multilingual Education in Teaching Grade III Math:
Its Perceived Effect on the Pupil's Academic Performance

Dear Respondents,

The purpose of this study is to solicit information and determine the extent of MTB-MLE in teaching Grade III Mathematics and its perceived effect on the pupils' academic performance. Please fill out the questionnaire with the needed information and be objective with your responses. Rest assured that your responses will be held confidential and be treated objectively. Thank you very much!

Part I. TEACHERS' PROFILE

Direction: Please answer the item to the following information.

1. Name: _____
2. Highest Educational Attainment
 - () Doctoral Degree
 - () With Doctoral Degree Units
 - () Master's Degree
 - () With Master's Degree Units
 - () Bachelor's Degree
 - () Others (please specify)
3. Number of years in teaching Mathematics: _____
4. Relevant Trainings Attended Related to K-12 for the Last Three Years

| Topics | Yes | No | No. of Times |
|--|-----|----|--------------|
| 1. Mass Training of Teachers on K-12 curriculum | | | |
| 2. Mother Tongue as Medium of Instruction | | | |
| 3. Teaching Strategies for Mother Tongue Instruction | | | |
| 4. Framework of the K - 12 Program | | | |

Part II. Extent of use in MTB-MLE Instruction in Relation to Grade 3 Pupils' Mathematics Performance

1. To what extent have the MTB-MLE been used by the teacher-respondents in teaching Grade 3 Mathematics and its effect on the performance of the pupils?

Legend:

| Scale | Verbal Description | Equivalent | Explanation |
|-------|--------------------|---------------|---|
| 5 | Very High | Almost Always | The teaching practice in Math is implemented by the teacher 81-100% of the time. |
| 4 | High | Often | The teaching practice in Math is implemented by the teacher 61-80% of the time. |
| | | Sometimes | The teaching practice in Math is implemented by the teacher 41-60% of the time. |
| 3 | Fair | | The teaching practice in Math is implemented by the teacher 21- 40% of the time. |
| 2 | Low | Rarely | The teaching practice in Math is implemented by the teacher 1-20% of the time. |
| | | Almost Never | <i>Note:</i> time refers to the 2 nd quarter from September to November of S.Y 2016-2017 |
| 1 | Very Low | | |

| Practices | Almost Always | Often | Sometimes | Rarely | Almost Never |
|---|---------------|-------|-----------|--------|--------------|
| A. Language used by the Teachers in Teaching Mathematics | | | | | |
| 1. Sinugbuanong Binisaya/Cebuano | | | | | |
| 2. Tagalog | | | | | |
| 3. English | | | | | |
| B. Teacher Practices in Using the Language | | | | | |
| 1. I shift from one language to another (e.g. Sinugbuanong Binisaya to Tagalog to English) as the needed arises. | | | | | |
| 2. I translate the terms not understood in English to Tagalog or Sinugbuanong Binisaya for the language pupils to understand. | | | | | |
| 3. I teach in English then translate in Sinugbuanong Binisaya. | | | | | |
| 4. I modify the language in the textbook by using conversational Sinugbuanong Binisaya. | | | | | |
| 5. I allow my pupils to count in English then translate it in Sinugbuanong Binisaya. | | | | | |
| 6. I use code switching/mixing in explaining the concepts in Mathematics. | | | | | |
| 7. I use my language of instruction in constructing my pupils' tests or exams. | | | | | |
| Strategies in Teaching Mathematics | | | | | |
| 1. I teach Math in the context of day to day living of the child | | | | | |
| 2. I teach number concepts through songs and rhymes in local culture. | | | | | |
| 3. I present lessons from real life concrete objects to abstract. | | | | | |
| 4. I give activities that are interesting and enjoyable | | | | | |
| 5. that require direct manipulation of concrete objects. | | | | | |
| 5. I use cultural concepts to teach basic concepts in math. | | | | | |
| 6. I emphasize understanding, meaning as well as development. | | | | | |
| 7. I develop concepts through matching, identification, naming objects and naming pictures of objects. | | | | | |
| 8. I teach by modelling and by demonstrating. | | | | | |
| 9. I clap when counting with the children. | | | | | |
| 10. I encourage accurate thinking and problem solving. | | | | | |
| 11. I stress accuracy in the manner of solving problem. | | | | | |
| 12. I encourage mastery of skills through drills and adequate exercises. | | | | | |
| 13. I do outdoor Math with my pupils. | | | | | |
| 14. I employ collaborative/cooperative activities through puzzles and problem situations. | | | | | |
| 15. I employ interactive learning through question and answer. | | | | | |

| | | | | | |
|--|--|--|--|--|--|
| 16. I encourage peer tutoring. | | | | | |
| 17. I give modular activities and seatwork. | | | | | |
| 18. I integrate Mathematics in other subject areas. | | | | | |
| 19. I encourage my pupils to give situations for problem solving in Math. | | | | | |
| 20. I allow my pupils to do online games in Math inside the classroom. | | | | | |
| D. Practices in the Use of Instructional Materials | | | | | |
| 1. I use counters like bundled sticks, straws, stones, seeds, etc. | | | | | |
| 2. I provide cut-outs and pictures. | | | | | |
| 3. I use flashcards. | | | | | |
| 4. I prepare "Show me cards". | | | | | |
| 5. I provide number cards. | | | | | |
| 6. I use place value chart. | | | | | |
| 7. I use building blocks. | | | | | |
| 8. I provide work sheets/activity sheets. | | | | | |
| 9. I give exercises written on charts. | | | | | |
| 10. I give board work after discussing the lesson. | | | | | |
| 11. I use children's textbook. | | | | | |
| 12. I photocopy children's textbook. | | | | | |
| 13. I use modules in my class. | | | | | |
| 14. I use old textbooks written in English. | | | | | |
| 15. I prepare teacher made exercises. | | | | | |
| 16. I use LCD projector. | | | | | |
| E. Assessment and Evaluation Techniques | | | | | |
| 1. Giving of paper and pencil test | | | | | |
| a. formative test | | | | | |
| b. summative test | | | | | |
| c. periodical test | | | | | |
| d. diagnostic test | | | | | |
| 2. Oral recitation | | | | | |
| 3. Group work | | | | | |
| 4. Use of rubrics and rating scale | | | | | |
| 5. Portfolio assessment | | | | | |
| 6. Performance test | | | | | |
| 7. Teacher observation | | | | | |
| F. Parents' Involvement in Relevant Activities | | | | | |
| 1. I give assignment/homework during weekdays so that parents could also be aware of their children's lessons. | | | | | |
| 2. I schedule meetings for parents to discuss children's academic performance every grading period. | | | | | |
| 3. I invite parents in school as the need arises. | | | | | |
| 4. I involve parents in preparation and production of instructional materials. | | | | | |
| 5. I encourage parents to monitor the performance of their children in school. | | | | | |