INSTABRIGHT e-GAZETTE
ISSN: 2704-3010
Volume V, Issue I
August 2023
Available online at https://www.instabrightgazette.com

THE RELATIONSHIP BETWEEN THE UTILIZATION OF MOTHER TONGUE IN TEACHING MATHEMATICS AND PUPILS' PERFORMANCE: BASIS FOR ACTION PLAN

JENEFFER DE OCAMPO INCISO
Teacher III
Aliji Elementary School
jeneffer.inciso@deped.gov.ph

Context and Rationale

The latest metamorphosis of basic education curriculum introduces the Filipino learners to new ways in learning Mathematics, specifically in the medium used to teach this discipline. English language which has always become the greatest barrier most of the learners encounter is no longer the medium of instruction in teaching Mathematics for kindergarten and the first three (3) grade level of basic education.

As one of the banner programs of K-12, Mother Tongue- Based Multilingual Education (MTB-MLE) is seen to provide higher literacy since it can develop skills that are also used in reading any other language. Besides, MTB-MLE engages learners more in class discussion. Using their mother language, it is easier for them to integrate and apply the past knowledge into current knowledge schemes.

Mother Tongue- Based Multilingual Education (MTB-MLE) also provides a strong foundation in developing cognitive skills by serving as a bridge to listening, writing and reading. In the past, using the second language as the primary language in teaching is not sufficient in

INSTABRIGHT e-GAZETTE
ISSN: 2704-3010
Volume V, Issue I
August 2023
Available online at https://www.instabrightgazette.com

developing the decoding skills within a meaningful context. In short, using the second language as a medium of instruction helps only to develop the decoding skills. Learners can read the words but they lack in understanding what they are reading.

The major shift mandated by the DepEd in teaching Mathematics to pupils from Kindergarten to Grade Three has brought struggle to the teachers. It is not easy to deviate from what the teachers are accustomed to. They are accustomed to teach Mathematics in English language and they find it challenging aside from being awkward to translate many mathematical concepts in Tagalog.

Despite the effort of the teachers to embrace the changes brought by the new curriculum, researcher who are also teaching Mathematics in Aliji Elementary school still observe many difficulties on the part of the pupils. With the freedom of speaking in their native language, the pupils are still hesitant to do board works and explaining their answer. As soon as the teachers start discussing Mathematics, it is very evident that they do not have the interest. Most of them are yawning or having small chit chat with seat mate. While some are too busy doing other things in their seat. All these difficulties manifested in their first quarter assessment. Most of them obtained grades that are lower that what they are expected.

Truly, the major shift mandated by the Department of Education in teaching Mathematics through the use of Mother Tongue has become one of the challenges of most teachers. Thus, this study is deemed beneficial to pupils, teachers, and parents. Furthermore, the researcher

INSTABRIGHT e-GAZETTE
ISSN: 2704-3010
Volume V, Issue I
August 2023
Available online at https://www.instabrightgazette.com

believe that this undertaking will give a very significant contribution to educational institutions, to the body of knowledge and to the professional development of the researcher.

As epitome of knowledge, teachers have to assess their performance based on the outcomes for the pupils. Using the student grades as the basis of outcomes, teachers can gauge if the methods they utilize in teaching are effective. An in-depth analysis of the pupils' performance is an avenue of the teachers to sit back and make a careful evaluation of their teaching style. Thus, any mismatch between teaching styles and learning styles of students can be immediately identified. Moreover, this study is perceived very significant by the researcher in upraising the level of professional development of the researcher. The result of this study may create avenues for the utilization of teaching strategies that perfectly match with the learning styles of the pupils.

Literature

Pursuant to section 10 of Republic Order No. 10533 or the Enhance Basic Education Curriculum, teachers of Kindergarten and Grade 1 to Grade 3 levels are required to deliver their lesson in the vernacular language that is understood by all learners. The curriculum shall develop proficiency in Filipino and English, provided that the first and dominant language of the learners shall serve as the fundamental language of education. For Kindergarten and the first three years

INSTABRIGHT e-GAZETTE
ISSN: 2704-3010
Volume V, Issue I
August 2023
Available online at https://www.instabrightgazette.com

of elementary education, instruction, teaching materials and assessment shall be in the regional or native language of the learners.

The DepEd shall formulate a mother language transition program from the mother/first language to the subsequent languages of the curriculum that is appropriate to the language capacity and needs of learners from Grade 4 to Grade 6. Filipino and English shall be gradually introduced as languages of instruction until such time when these two (2) languages can become the primary languages of instruction at the secondary level. (retrieved, 2016).

Research stresses the fact that children with a solid foundation in their mother tongue develop stronger literacy abilities in the school language. Their knowledge and skills transfer across languages. This bridge enables the learners to use both or all their languages for success in school and for lifelong learning. In terms of cognitive development, the school activities will engage learners to move well beyond the basic wh-questions to cover all higher order thinking skills in L1 which they can transfer to the other languages once enough Filipino or English has been acquired to use these skills in thinking and articulating thoughts. With the end goal of making Filipino children lifelong learners in their L1 (MT), L2 (Filipino, the national language), and L3 (English, the global language) the learners are more than prepared to develop the competencies in the different learning areas. This will serve as their passport to enter and achieve well in the mainstream educational system and in the end, contribute productively to their community and to the larger society as well as Multilingual, Multiliterate, and Multi-Cultural

INSTABRIGHT e-GAZETTE
ISSN: 2704-3010
Volume V, Issue I
August 2023
Available online at https://www.instabrightgazette.com

Citizens of the country. For the effective implementation of the MTB-MLE, it is suggested that the two-track method be used, that is the primer track to focus on accuracy and the story track to focus on meaning. Learning via the two-track method to gain proficiency in literacy as well as comprehend academic content and gain curriculum mastery, creative and critical thinking skills for decisive decision-making.

MTB-MLE develops skills that transfer to reading any other languages. It provides comprehension in reading other languages. It only occurs after oral proficiency has developed such that vocabulary of the written L2 text is already part of the learners' spoken vocabulary. It enhances prior knowledge and engages learners in a discussion of what is already familiar to them using the home language and culture enables better.

Similarly, MTB-MLE helps for cognitive development and higher order thinking skills (HOTS). Using the learners' mother tongue provides a strong foundation by developing cognitive skills and comprehension of the academic content from day one. The knowledge, skills, attitudes, and values gained through the mother tongue better support learning of other languages and learning through other languages later. As learners articulate their thoughts and expand ideas, both language and critical thinking are strengthened.

MTB-MLE cultivates critical thinking through talking about ideas in the familiar language. When teaching only in the L2, critical thinking is postponed until L2 is sufficiently developed to support such analysis. MTB-MLE provides a good bridge to listening, speaking, reading, and

INSTABRIGHT e-GAZETTE
ISSN: 2704-3010
Volume V, Issue I
August 2023
Available online at https://www.instabrightgazette.com

writing the L2s (L2, L3) of the classroom using sound educational principles for building fluency and confidence in using the other languages for lifelong learning. Reading in the L2 is only introduced after basic L1 reading fluency and L2 oral proficiency are developed. Comprehension in reading the L2 occurs after the development of that spoken L2. Once sufficient oral and written proficiency in the L2 are developed, a gradual transition to using the L2 as medium of instruction can progress without the L1 support. In L2 teaching, the L1 is used to support learning when the L2 is not sufficiently developed to be used alone. The L1 is used for expression and the teacher facilitates the development of the L2 to enable learners to adequately express ideas in the L2. In this way, the L1 strengthens the learning of the L2 by supporting the L2 development for communication.

MTB-MLE also becomes a vehicle in teaching for meaning and accuracy. Decoding text requires accuracy, while comprehending texts requires decoding skills within a meaningful context. Both meaning and accuracy are important, but in classrooms that teach only L2 , there is often primary focus on accuracy until the L2 is sufficiently learned. This delays actual meaningful learning until the L2 can support that learning. (retrieved, 2016)

Research Questions

This paper attempted to assess the utilization of the Mother Tongue in teaching Mathematics 2 in Aliji Elementary School, a school situated in Brgy. Aliji Tagkawayan, Quezon.

INSTABRIGHT e-GAZETTE
ISSN: 2704-3010
Volume V, Issue I
August 2023
Available online at https://www.instabrightgazette.com

Specifically, the following were the compelling questions relative to the problem at hand:

1. What is the current knowledge gained by the grade 2 pupils in Mathematics based on the results of the first quarter assessment?
2. What is the assessment of the pupils on the effectiveness of Mother Tongue in learning Mathematics?
3. Is there a significant relationship that exists between the utilization of Mother Tongue in learning Mathematics and the pupils' performance in Mathematics?
4. What plan of actions can be suggested based on the results of the study?

Scope and Limitation

This study focused on the utilization of Mother Tongue in teaching Mathematics 2. The researcher utilized the performance of the students in Mathematics 2 as one of the variables of the study. Other variable includes the assessment of the pupils on the effectiveness of Mother Tongue in learning Mathematics.

The respondents of the students were the Grade Two pupils of Aliji Elementary School. There were 36 grade 2 pupils whose grades were analyzed and who also assessed the effectiveness of the utilization of Mother Tongue in learning Mathematics. The researcher analyzed the performance of the pupils in Mathematics 2 in the first quarter only because of time constraints. The analysis and interpretation of data took place during the month of November in

INSTABRIGHT e-GAZETTE
ISSN: 2704-3010
Volume V, Issue I
August 2023
Available online at https://www.instabrightgazette.com

which the grades available were the grades for first quarter. On the other hand, the researcher chose to utilize the Grade Two students as respondents because the researcher is currently teaching in Grade Two pupils. Moreover, more complicated topics in Mathematics are introduced in Grade Two level. It took 6 months for the researchers.

Methodology

The researcher utilized the Descriptive Survey Research method in this study. Descriptive survey research is used to describe existing phenomenon and its association or relationships with other variables.

The respondents of the study were thirty-six (36) grade 2 pupils of Aliji Elementary School. They were given questionnaires that include their assessment on the effectiveness of mother tongue in learning mathematics. The researcher also evaluated their performance so far in Mathematics thru their first quarter grade in Mathematics.

Before the actual distribution of questionnaires, the researcher consulted an expert regarding the content of the questionnaires as face validation. There were some modifications done in accordance with the correction of the expert. After the final draft of the questionnaires, the researcher used thirty (30) Grade Three pupils as dummy respondents. As part of the validation process, the researcher used Cronbach Analysis because the questions are likert-style questions. Questions that have low reliability were removed.

INSTABRIGHT e-GAZETTE
ISSN: 2704-3010
Volume V, Issue I
August 2023
Available online at https://www.instabrightgazette.com

The actual distribution of questionnaires took place after the validation process. The researcher read the question one by one to the pupils to make sure that the pupils understood the questions. A conceptual framework of the study is exhibited in figure 1.

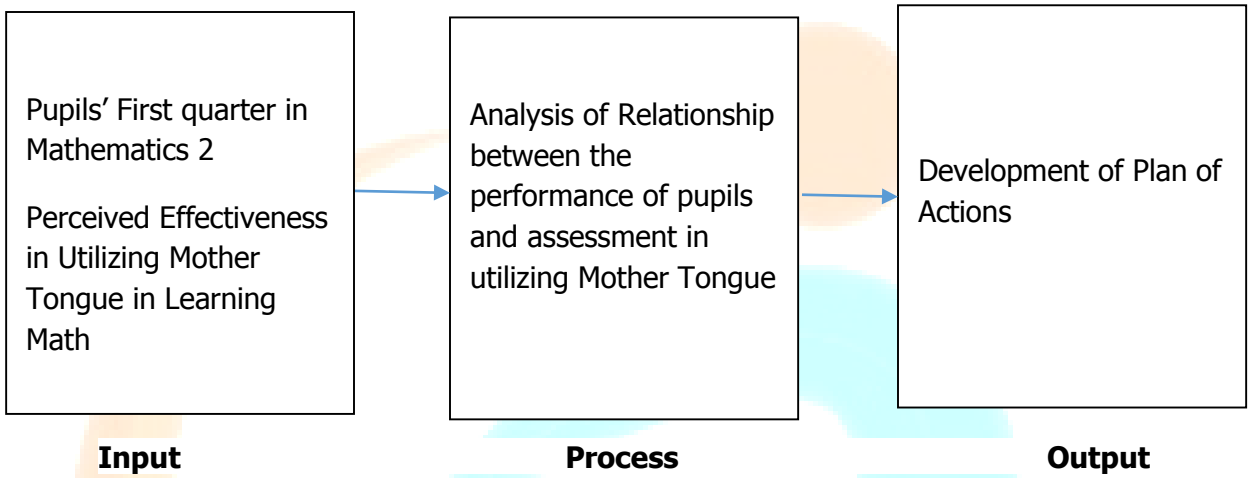

Figure 1

Conceptual Framework

INSTABRIGHT e-GAZETTE
ISSN: 2704-3010
Volume V, Issue I
August 2023
Available online at https://www.instabrightgazette.com

Work plan

Table 1

Timetable for the Preparation of Action Research

Activity	Time Frame
1. Reading of Related Literature and Study	November 1-15, 2022
2. Development of Research Questions	December 1-15, 2022
3. Devising of Research Instrument	January 1-30, 2023
4. Validation of Research Instrument	Februaryv1-5, 2023
5. Modification of Research Instrument after Validation	February 7-9, 2023
6. Distribution of actual questionnaires	February 15-30, 2023
7. Analysis and Interpretation of Results	March 1-15, 2023
8. Development of Action Plan	March 16-30, 2023
9. Finalization of final paper	April 1-15, 2023

INSTABRIGHT e-GAZETTE
ISSN: 2704-3010
Volume V, Issue I
August 2023
Available online at https://www.instabrightgazette.com

Cost Estimates

Table 2

Cost Estimates

Budget Item	Budget Requirement
Coupon bond	**600**
Gift for validation expert	**400**
Snacks for Grade Two pupils	**3, 000**
Computer ink	**1, 000**
TOTAL	**5, 000**

Action Plan

Table 3

Suggested Action Plan to Increase the Parental Involvement to School Programs and Activities

Objectives	Plan of Actions	Time frame	Expected Outcome
. Increasing the Student motivation in Math thru classroom-based instruction	1. Present a few simple exercises involving familiar situations, followed by exercises involving unfamiliar situations on the same topic (individual Learning). 2. Set up a contrived situation that leads students to discovering pattern. Visuals and graphics aided by multimedia can be used to lead students to discover patterns. (Think-Pair share) 3. Present a challenge that is within the reach of the students' abilities (Small group discussion) 4. Let the students express the usefulness of the topic using their MI. (Individual Learning) 5. Peer tutorial after the class. (Dyad) 6. Create a Mathematics corner. This is not limited to bulletin board. Include figures and structures that have to do with Mathematics 7. Use recreational mathematics during motivation, lesson proper and assessment.	Everyday	Maximum participation of students during classroom discussion Appreciation of the use of mathematics in daily life Increased confidence in solving mathematical problems

INSTABRIGHT e-GAZETTE

ISSN: 2704-3010

Volume V, Issue I

August 2023

Available online at https://www.instabrightgazette.com

****

	8. Show a logical sequence of concepts.		
2. Increasing the Student motivation in Math beyond classroom based-instruction.	1. Hold a "Math Camp" in the campus. This includes activities that will showcase and improve the Math skills of the students and at the same time camaraderie among them. All students should participate regardless of their level of skills 2. Set up a Math laboratory where students can make a tour and find different Math structures and where they can also exhibit their Math work 3. Solicit different Math videos and make them available to watch in the Math laboratory	Once a year All year round	Increased interest of students in exploring the outputs in Mathematics Decreased gap in the percentage of advance learners and slow learners.
3. Increasing the Student motivation in Math thru home-based learning	1. Give a very short homework every day. Make the parents involve by sending a slip for parents to sign. The slip speaks of the parents awareness of their child's progress in Math. 2. Let the parents write a short comment below the answered homework regarding the difficulty/experience encountered by their children in answering their homework	Every night except weekends	Maximum parental involvement Established relationship between parents and children

3. Increasing the Student motivation in Math thru home-based learning	1. Give a very short homework every day. Make the parents involve by sending a slip for parents to sign. The slip speaks of the parents awareness of their child's progress in Math. 2. Let the parents write a short comment below the answered homework regarding the difficulty/experience encountered by their children in answering their homework	Every night except weekends	Maximum parental involvement Established relationship between parents and children

****

****

INSTABRIGHT e-GAZETTE
ISSN: 2704-3010
Volume V, Issue I
August 2023
Available online at https://www.instabrightgazette.com

Discussion of Results

This part of the study presents the data gathered through the research instruments. It presents the different data in tabular form, followed by the analyses on the basis of the applied statistical treatment along with the interpretation and arranged in accordance with the objectives of the study.

1. First Quarter Performance in Mathematics of Grade 2 Students

Table 4
First Quarter Assessment of Pupil –respondents in Mathematics 2

Grades	Description	Frequency	Percentage	Rank
90-100	Outstanding	5	14%	2
80-84	Satisfactory	2	6%	5
75-79	Fairly Satisfactory	3	8%	4
74 and below	Did not meet expectations	22	61%	1
Total		**36**	**100%**	

Class mean = 75 Standard deviation = 10.08

Table 4 reveals the first quarterly assessment of performance of Grade Two pupils in Mathematics in Aliji Elementary School. As shown, more than half of the total number of pupils did not meet the expectations in Mathematics 2 (n = 22 , % = 61%). Students are not able to achieve the expected outcome if their grade is lower than 75. There were five (5) students who obtained a grade within the range of 90-100 while there were four (4) students who obtained a

INSTABRIGHT e-GAZETTE
ISSN: 2704-3010
Volume V, Issue I
August 2023
Available online at https://www.instabrightgazette.com

grade within the range of 85-89. On the other hand, there are five (5) pupils who obtained a grade within the range of 75-84.

Looking closely to the results presented in the above table, the mean performance of the group or the average performance is 75. Although there were many students who got grades lower than what is the expected outcome, there are also few outliers as manifested by five highest grades (90-100). Those outliers pulled up the mean or the average grade. What does it mean? The result simply implies that as a whole, the class did not meet the expected outcome although the mean is 75 because of the role of the outliers.

The issue about the outliers is supported by a very large standard deviation of 10.08. Thus, it can be concluded that there is a very big variation among the performances of Grade Two students in Mathematics. There are few learners who are very advanced and majority of them are on the other extreme. There were about 25% or 9 students who were considered as average learners.

2. Perceived Effectiveness of Mother Tongue in Learning Mathematics

Table 5
Perceived Effectiveness of Mother Tongue in Learning Mathematics in terms of Comprehension

Items	Level of Involvement		
	Mean	Rank	Interpretation
1. Nabibigkas ko ang mga numero mula sa wikang English tungo sa wikang Tagalog	3.08	1	Sometimes

INSTABRIGHT e-GAZETTE
ISSN: 2704-3010
Volume V, Issue I
August 2023
Available online at https://www.instabrightgazette.com

2. Naisusulat ko ang mga numero na idinedekta ng aking guro gamit ang wikang tagalong at wikang English	3.05	2	Sometimes
3. Nauunawaan ko ang pagkakaiba ng gamit ng apat na pangunahing operasyon sa Matematika	2.93	3	Sometimes
4. Naiintindihan ko ang mga wikang salin sa Filipino na may kaugnayan sa Matematika	2.50	4	Seldom
Composite Mean	**2.89**		**Sometimes**

Table 5 displays the perceived effectiveness of the use of Mother Tongue in learning Mathematics in terms of comprehension. It was attested by the learners that although everybody is a native speaker of Tagalog, they are still struggling in understanding the basics of Mathematics (composite mean = 2. 89, VI ="sometimes"). They are able to distinguish numbers both in English and Tagalog when they need to speak (mean = 3.08) and write (mean = 3.05). However, they have a hard time in understanding other terms in Mathematics that are translated to Tagalog (mean = 2.50).

Their difficulty in comprehension boils down to the rich collection of Tagalog words. Quezonians are using Tagalog words that are not used by other provinces in the region. Although most of the Tagalog words can be found in Filipino language, there are still some Filipino words that Quezonians are not familiar with. Thus, there is still a loophole in using the module and other learning materials printed in Filipino which are used by Tagalog native speakers.

INSTABRIGHT e-GAZETTE
ISSN: 2704-3010
Volume V, Issue I
August 2023
Available online at https://www.instabrightgazette.com

Table 6
Perceived Effectiveness of Mother Tongue in Learning Mathematics in terms of Analysis

Items	Level of Involvement		
	Mean	Rank	Interpretation
1. Napapagsama ko ang mga numero na isahan	3.25	1	Sometimes
2. Napapagsama ko agn mga numero na dalawahan at higit pa	2.57	3	Seldom
3. Nakakapagbawas ako ng mga numero na isahan	3.13	2	Sometimes
4. Nakakapagbawas ako ng mga numero na dalawahan at higit pa	2.03	4	Seldom
Composite Mean	**2.75**		**Sometimes**

In terms of analysis, pupils also struggled in Mathematics as manifested by a composite mean of 2.75. They struggled most in subtracting two-digit numbers (mean =2.03) especially in terms of borrowing. Researcher observed that most of the pupils are still using their toes and fingers to execute the two basic operations – sum and difference. Therefore, numbers that are more than the number of their combined toes and fingers become a challenge for them to solve. They also struggled in adding two digit numbers (mean= 2.57). Their struggle is observed most in performing the carry over. Unexpectedly, they are not that confident in adding (mean =3.25) and subtracting (3.13) single-digit numbers.

INSTABRIGHT e-GAZETTE
ISSN: 2704-3010
Volume V, Issue I
August 2023
Available online at https://www.instabrightgazette.com

Table 7
Perceived Effectiveness of Mother Tongue in Learning Mathematics in terms of Application

Items	Level of Involvement		
	Mean	Rank	Interpretation
1. Nagagawa kong hanapan ng solusyon ang mga poblema sa Matematika na may kaugnay sa pagsasama ng numero.	2.40	1	Seldom
2. Nagagawa kong hanapan ng solusyon ang mga poblema sa Matematika na may kaugnay sa pagbabawas ng numero.	2.27	2	Seldom
3. Nagagawa kong hanapan ng solusyon ang mga poblema sa Matematika na may kaugnay sa kombinasyon ng pagsasama at pagbabawas ng numero.	1.97	3	Seldom
Composite Mean	**2.21**		**Seldom**

Table 7 attested that the Grade Two pupils of Aliji Elementary School have gaps in higher order thinking skills (HOTS) as shown by the composite mean of 2.21. They struggled in solving situational problems involving addition (mean = 2.40), situational problems involving subtraction (mean = 2.27) and most especially in the combination of both operations (mean = 1.97).

The struggle of the pupils can be attributed to their level of basic numeracy skills. Remembering and understanding are the foundations of learning and are needed to attain higher skills that include applying, analyzing, evaluating and creating (Krathwoll and Anderson). Researcher observed that they can tell the given information and the problem that is being asked but when the process reaches to the writing of the required mathematical sentence and solving the mathematical sentence, they are struggling.

INSTABRIGHT e-GAZETTE
ISSN: 2704-3010
Volume V, Issue I
August 2023
Available online at https://www.instabrightgazette.com

****

3. Relationship between the First Quarter Performance of Grade 2 Pupils in Mathematics and their Perceived Effectiveness of the Use of Mother Tongue in Learning Mathematics

A positive moderate correlation exists between the first quarter performance of grade 2 pupils in Mathematics and their perceived effectiveness of the use of mother tongue in learning Mathematics in terms of comprehension (r =0.25), analysis (r =0.17) and application (r =0.27). However, the correlation coefficient does not manifest a significant relationship between the two aforementioned variables ($p > 0.05$).

The results imply that the use of Mother Tongue is not a predictor of a positive pupils' performance in Mathematics. Although there is an existing correlation between the variables, still the variation in the performance of the students in Mathematics is not attributed to their assessment of the effectiveness of utilization of mother tongue in learning Mathematics. There are other factors that were present and caused the variation in the pupils' first quarter performance.

Table 8

Relationship between the First Quarter Performance of Grade 2 Pupils in Mathematics and their Perceived Effectiveness of the Use of Mother Tongue in Learning Mathematics

Variable	WM	r	p-value
Comprehension	2.89	0.25	0.08
Analysis	2.75	0.17	0.17
Application	2.21	0.27	0.07

****

****

INSTABRIGHT e-GAZETTE
ISSN: 2704-3010
Volume V, Issue I
August 2023
Available online at https://www.instabrightgazette.com

****

CONCLUSIONS AND RECOMMENDATIONS

A. Conclusion

1. The Grade Two students of Aliji Elementary School did not meet the expected outcome in Mathematics during the first quarter assessment.

2. The use of mother tongue is not a predictor of students' performance in Mathematics. It can be helpful but cannot be considered as major factor in learning Mathematics.

B. Recommendations

1. Administer a comprehensive diagnostic test to know where the students are and scaffold if necessary.

2. Follow the suggested action plan and make it a spring board in improving the performance of the students in Mathematics. Strategies should be limited to what are included in the plan to avoid external variables that might affect the future assessment of the outcome of the action plan.

3. Provide an assessment of the implementation of the action plan to evaluate its effectiveness.

4. Make a follow-up action research based on the assessment of the outcome.

INSTABRIGHT e-GAZETTE
ISSN: 2704-3010
Volume V, Issue I
August 2023
Available online at https://www.instabrightgazette.com

****

References

K-12 Curriculum Guide (2013) Retrieved (2016) from http://www.deped.gov.ph/sites/default/files/page/2015/Final%20Mother%20Tongue%20Grades%201-3%2001.21.2014_EDITED%2002.24.2015.pdf

Implementing Rules and Regulations of the Enhanced Basic Education Act of 2013 (2013). Retrieved (2016) from http://www.gov.ph/2013/09/04/irr-republic-act-no-10533/

Decipulo, Joven. (2014). *Effectiveness of Mother Tongue-based Instruction on Pupils' Achievement in Mathematics*. Retrieved (2016) from https://www.academia.edu/10401349/EFFECTIVENESS_OF_MOTHER_TONGUE-BASED_INSTRUCTIONON_PUPILS_ACHIEVEMENT_IN_MATHEMATICS

Llaneta, Celeste Ann Castillo. (2010). *The Language of Learning: Mother Tongue-based Multilingual Education in the Philippines.* The Forum Vol 11 Issue number 2. Cebu City

****

****