THE PUPILS’ PROFILE AND THEIR PERFORMANCES IN THE ENGLISH-BASED AND MOTHER TONGUE-BASED EXAMINATIONS IN MATHEMATICS

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ABSTRACT

This study examined the pupils’ profile and their performances in the English-based and Mother Tongue-based examinations in Mathematics. The purpose of the study was to help school leaders cultivate professional development that can successfully address some identified challenges met by MTBMLE teachers when transitioning into Mother Tongue-Based Multi-Lingual Education (MTBMLE).

The researcher conducted this research for a month after the 2nd quarter periodical test of the grade IV pupils in seven complete elementary schools of Sibulan South District, Negros Oriental, Philippines. The researcher determined the relationship between the demographic profiles as independent variables and the level of performance of the researcher’s Mother Tongue-based self-made test as well as 2nd quarter English-based test as dependent variables.

The data show that the Binasaya is the most common mother tongue of the Bisaya respondents regardless of the type of community they reside and their monthly family income. From the test results, however, the pupils of the grade IV English-based and the Mother Tongue-based Mathematics achieve average mastery level in Mathematics skills. The test of relationship between the two variables against the demographic profile of the respondents is not statistically significant except the type of community. However, it is significantly different on English-based test and mother tongue-based test as well when group according to the demographic profiles. Hence, in the test of correlation between the performance of English-based and Mother Tongue-based examination, the null hypothesis is rejected.

Therefore, there is a statistically significant relationship between the two variables.

Keywords: Type of Community, Ethnicity, Mother Tongue, Mother Tongue-Based Multi-Lingual Education (MTBMLE), MTB Mathematics test, descriptive design, correlational design, Language-based Theory of Learning (LTL), Social Interaction and Sociocultural Theories, R. A. 10533
The Pupils’ Profile and Their Performances in the English-Based and Mother Tongue-Based Examinations in Mathematics

Introduction

The main target of Education for All (EFA) 2015, specifically goal 6, was to improve every aspect of quality education (UNESCO, 2000). However, Jesli Lapus, former Secretary of Department of Education (DepEd), admitted that the quality of education in the country had sunk to its lowest level based on the performance of National Achievement Test 2006 (Ubac, 2008).

Meanwhile, Mathematics plays a dynamic role in people’s daily lives. It leads people to discover and invent a lot of technological devices. It is the key to all sciences. Hence, effective Mathematics instruction had become an absolute necessity in all levels of education (Gabriel, 2012). However, the situation was ironically different knowing that pupils think Mathematics taught in school is a boring subject which includes memorizing formulas and analyzing difficult problems. They believe that only the four fundamental operations are relevant to their daily experiences. The result of this misconception developed a negative attitude of the pupils towards Mathematics (Swan, 2004).

The performance of the pupils revealed the gap between Mathematics taught in English-based formal education and Mathematical practices developed culturally by people outside the schools. So, the researcher also investigated the performance of the grade IV pupils in Mathematics as the first results of K-12 program implementing Mother Tongue-based education from grade one to grade three.

Consequently, these reflections persuaded the researcher to conduct a study on the pupils’ profile and their performances in the English-based and Mother Tongue-based examinations in Mathematics.

This study aimed to examine the Mother Tongue-based performance in Mathematics with demographic profile of the respondents and the relationship among these variables.

Specifically, the study sought answers to the following questions:

1. What is the demographic profile of the respondents in terms of:
   1.1. type of community;
   1.2. ethnic group;
   1.3. mother tongue;
   1.4. family monthly income?
2. What is the level of performance of the grade IV in 2nd quarter Mathematics periodical test and the Mother Tongue-based examination in Mathematics?
3. Is there a significant relationship between the demographic profile of the respondents and:
   3.1. grade IV 2nd quarter mathematics periodical test;
   3.2. Mother Tongue-based examination in Mathematics?
4. How do the tests scores of the pupils who took the English-based test and Mother Tongue-based test compare when grouped according to the variables in question number 1?
5. Is there a significant relationship between respondents’ performance in the Mother Tongue-based examination and English-based examination in Mathematics?
The null hypotheses which the researcher investigated are:

H₀₁: There is no significant relationship between the demographic profile of the respondents and:
1. Grade IV 2nd quarter mathematics periodical test;

H₀₂: There is no significant relationship between respondents’ performance in the Mother Tongue-based examination and English-based examination.

**Research Design and Methods**

This section presents the methods of research, the procedures of the study, population, sample and sampling technique, research instrument, data collection procedure and statistical treatment of data used in the study.

The independent variables consist the demographic profile of the respondents such as the type of community, mother tongue, ethnic group, and monthly income. The dependent variables included the performance level of the grade IV 2nd quarter Mathematics (English-based test) and researcher-made test (mother tongue-based). The study’s variables were further taken into account by the researcher by analyzing them correlatively in an independent-dependent variable fashion.

In this manner, the researcher determined the relationship between the independent variables and the level of performance of mother tongue-based as well as English-based test. The findings would be used as baseline data for the public and private agencies or persons interested on the effect of Mother Tongue-based classroom instruction.

The purpose of this study was to determine the demographic profile, Mother Tongue-based performance and the relationship between these variables of the respondents. This study used mixed method which is a combination of descriptive and correlational research. The data gathered were quantified, described, and analyzed. The researcher made inferences and generalization out of the data gathered.

The respondents of this study were seven (7) randomly selected sections of grade four pupils of seven public complete elementary schools of Sibulan South District, Division of Negros Oriental, officially enrolled during the school year 2015-2016. All were drawn at random if the school had more than one section.

Among the respondents, there are fifty or 18.87 % from Sibulan Central Elementary School. Bolocboloc Elementary School has forty-seven or 17.74 % respondents. Likewise, the three schools rank nearest to or in the median such as Maslog Elementary School, Calabnugan Elementary School, and Tubtubon Elementary School have forty or 15.09 %, thirty-eight or 14.34 % and thirty-six or 13.58 % respondents, respectively.

The two lowest in rank are Magatas Elementary School and Cangmating Elementary School which have only twenty-eight or 10.57 % and twenty-six or 9.81 % respondents. The total number of respondents in seven public elementary schools in Sibulan south district is 265 (100 %). From this sample, the researcher studied the two dependent variables and independent variables into four groups, namely, scores from the 2nd quarter English-based test, scores from researcher’s Mother Tongue-based made-test, and the type of community, ethnic group, mother tongue and monthly income profile of the respondents.
Most of the families of the respondents are town folks of the municipality of Sibulan but some are transients. The town of Sibulan is a second-class municipality of Negros Oriental, Philippines. According to the census 2010, it had a population of around 51,619 people with 163.00 km² (62.93 sq. mi) land area. The entire DepEd Sibulan comprises South District and North District. The seven public complete elementary schools are located in lowland and most belong to the urban area except Calabnugan Elementary School.

The main instrument used in this study was the researcher’s mother tongue-based test. It was prepared with the coverage skills of the grade four 2nd quarter period. In this test, there are two main parts. Part one is about the demographic profile of the pupils as respondents in this study. It includes the information about the type of community, ethnic group, mother-tongue, and family monthly income of the respondents. Part two is the thirty-six-item test. It was presented to the adviser for comments and corrections and recommended by a math consultant from the Graduate School. It was also proofread by the three trained K-12 implementers in public elementary schools, which are Grade III, Grade IV, and MTBMLE national trainers of Grade I teachers, after which the final revision was done. Then, validation test was conducted with a Cronbach’s alpha .996 from 36 test items. Another type of instrument was the scores of grade four 2nd quarter English-based mathematics periodical test. It was prepared by the grade four teachers and submitted to the researcher.

After all those processes were undertaken to achieve a valid, reliable and objective instrument, the researcher wrote a permission letter to the DepEd, Division of Negros Oriental, for the conduct of the test, noted by the adviser and approved also by the Dean of the Graduate School. It was addressed to the Schools Division Superintendent through the endorsement of the office of the Public Schools District Supervisor. The test proper was conducted last November after receiving the approval letter from the division office of Negros Oriental, which was signed by the Schools Division Superintendent last November 4, 2015. This was followed by the administration of the test, immediate retrieval of test papers and answer sheets, and collection of scores of grade four 2nd quarter test. Tabulation, analysis, and interpretation followed after the retrieval of the answer sheets. The two dependent variables in this study addressed the problems stated in this research. It determined the performance level of the grade four 2nd quarter Mathematics test and the researcher’s mother tongue-based test using the mean per score (MPS). Next, it was to define the relationship on the level of performance in grade four 2nd quarter test in Mathematics and researcher-made Mother Tongue-based test against the four demographic profiles of the respondents using chi-square test.

The researcher extracted two types of data for the study: the nominal and the interval/ratio. Nominal and interval were gathered from the test questionnaire. Six statistical measures were used so as to come up with a sound and thorough processing of the raw data, to wit: Percentage, Mean Score, Mean Percentage Score, Fisher’s exact test- chi-square, Pearson product-moment correlation coefficient.

Results and Discussions

1. **The Demographic Profile of the Respondents**

   **Type of Community of Respondents.** It can be noted in Table 2 that majority are urban dwellers with 224 or 84.53 % respondents. There are only forty-one or 15.47 % pupils who reside in the rural type of community.
The data reveal the real situation that there is only one public elementary school in Sibulan South District situated in the rural type of community—Calabnugan Elementary School. It can be advanced at this point, that more pupils in this study are exposed to the developing society of Sibulan as well as in Dumaguete City, the capital city of Negros Oriental.

Alongside, Barangay Calabnugan is a little bit far from the highway and a remote area but the road widening and concreting project from LGUs was also possible to have the same access to those who are living in urban area.

*Ethnic Group of Respondents.* In table 3, almost 100% or 263 respondents are Bisaya. The Non-Bisaya is nearest to zero which is two or .8 %. Of the total respondents in the study, most of them belong to the Bisaya ethnic group. The data validate the dominant ethnic group in this study because the environment of the study is in Negros Oriental, a province in the Visayas region. It also shows that only few of the respondents are migrants from another region.

*Mother Tongue of Respondents.* The data in Table 4 reveal identical result to the ethnic group in Table 3. The Binisaya has 263 or nearest to 100 % talkers as the first language of the respondents. Only two or .8 % are Non-Binisaya.

<table>
<thead>
<tr>
<th>Ethnic Group</th>
<th>Bisaya</th>
<th>Non-Bisaya</th>
<th>Total</th>
</tr>
</thead>
<tbody>
<tr>
<td>Frequency</td>
<td>263</td>
<td>2</td>
<td>265</td>
</tr>
<tr>
<td>Percentage</td>
<td>99.2</td>
<td>0.8</td>
<td>100</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Mother Tongue</th>
<th>Binisaya</th>
<th>Non-Binisaya</th>
<th>Total</th>
</tr>
</thead>
<tbody>
<tr>
<td>Frequency</td>
<td>263</td>
<td>2</td>
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<td>99.2</td>
<td>0.8</td>
<td>100</td>
</tr>
</tbody>
</table>

Binisaya is expected as the mother tongue because it is commonly used in Sibulan and even in the whole province of Negros Oriental. Likewise, if the ethnic dominant group is Bisaya, so the mother tongue prevailed. Hence, the language of the child’s first community is definitely the first language (L1) of the child.

Monthly Income of Respondents. Table 5 presents the family monthly income of pupils’ parents by the respondents. More than a half of the respondents—one hundred eighty-six or 70.20 percent—identify Php 9,999 and below, over the rest of the options.
However, next to it (Php 10 000 – 39 999) which accounts 26.03 percent of the responses. Third is ‘Php 40 000 – 89 999’, which indicates 7 respondents or 2.64 percent of the sample. Lastly, Php 100 000 above is the least frequent, with less than 3 percent responses.

It is significant to note that the survey yielded a foreseeable outcome. In a public school setting, the most common income range falls from Php 9,999 and below. One thing that is noticeable with the data is that there are respondents belonging to an earner ranging from Php 10 000 and above. Whether we believe it or not, there are a few families whose earnings range from 80,000 and above. The instrument was limited only to the respondents’ family income. The validation of respondents’ responses was not done during the data gathering due to lack of time.

The dominant mother tongue or L1, Binisaya, is also the language that the respondents commonly use in a linguistic environment or oral interactions (Swain, 1990). Hence, the MTBMLE program addresses the finding of Nolasco’s study that many pupils do not understand what their teacher is saying (using L2) and, therefore, they cannot follow the lesson (2008). The pupils cannot get the meaning of the lesson because of the second language (L2) used by the teacher. This study confirms with Nolasco’s idea that using Mother-Tongue Based Multilingual Education (MTBMLE) makes the pupils express and engage themselves freely in learning the lessons.

2. Level of Performance of the Respondents in Grade IV Mathematics and in Mother Tongue-Based Mathematics

Table 6 presents the respondents’ level of performance in Grade IV Mathematics 2nd quarter test which is an English-based test. This variable is utilized to triangulate the quantitative study in mother tongue-based performance in Mathematics.

It shows that the Mean Percentage Score (MPS) of English-based test is 53.08. The highest frequency is the average mastery with 177 respondents. Next from the highest is moving towards mastery with 50 respondents. Then, it is followed by the low mastery with 25, closely approximating mastery with 9 and very low mastery with 4 respondents. The level of performance of the respondents in grade IV Mathematics is average mastery.
Apparentley, nobody obtains the mastery level, however, no one also falls under absolutely no mastery level. Moreover, only a few attain low and very low mastery level which is 25 and 4 respondents, respectively. Both results reveal that the performance of the respondents is average mastery in either English-based or mother tongue-based. This shows that most or 89% of the respondents get the average mastery skills in Mathematics as mean percentage score on a normal curve.

The Mean Percentage Score (MPS) of mother tongue-based test is 51.57. The highest frequency is the average mastery by 156 respondents. It is followed by moving towards mastery with 57, low mastery with 45, closely approximating mastery with 4, mastered with 2 and very low mastery with 1 respondent. The level of performance in Mother Tongue-based Mathematics of the respondents is average mastery.

Table 6 discloses also that the 51.57 MPS belongs to the average mastery level of performance in Mother Tongue-based Mathematics of the respondents. It is also consistent with the 156 frequency of respondents who fall under average mastery level of performance. Although, only 57 achieve moving towards mastery and four (4) closely approximating mastery, only two (2) respondents achieve mastery level. On the contrary, 45 respondents belong to low average mastery but only one (1) respondent plunges very low average mastery and none has absolutely no mastery. The level of performance reflected in Mother Tongue-based test is consistent with respondents’ achievement level which is settled at the average mastery level. Additionally, the 2 respondents, who achieve mastery level of performance, surpass due to the mother tongue-based test.

<table>
<thead>
<tr>
<th>Performance Level</th>
<th>English-based Test</th>
<th>Mother Tongue-based Test</th>
</tr>
</thead>
<tbody>
<tr>
<td>Mastered (96% - 100%)</td>
<td>0</td>
<td>2</td>
</tr>
<tr>
<td>Closely Approximating Mastery (86% - 95%)</td>
<td>9</td>
<td>4</td>
</tr>
<tr>
<td>Moving Towards Mastery (66% - 85%)</td>
<td>50</td>
<td>57</td>
</tr>
<tr>
<td>Average Mastery (35% - 65%)</td>
<td>177</td>
<td>156</td>
</tr>
<tr>
<td>Low Mastery (16% - 34%)</td>
<td>25</td>
<td>45</td>
</tr>
<tr>
<td>Very Low Mastery (5% - 15%)</td>
<td>4</td>
<td>1</td>
</tr>
<tr>
<td>Absolutely No Mastery (0% - 4%)</td>
<td>0</td>
<td>0</td>
</tr>
<tr>
<td><strong>Total</strong></td>
<td><strong>265</strong></td>
<td><strong>265</strong></td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th></th>
<th>Average Mastery</th>
<th>Average Mastery</th>
</tr>
</thead>
<tbody>
<tr>
<td>Highest Possible Score</td>
<td>36</td>
<td>36</td>
</tr>
<tr>
<td>Highest Score Obtained</td>
<td>36</td>
<td>35</td>
</tr>
<tr>
<td>Lowest Score Obtained</td>
<td>2</td>
<td>5</td>
</tr>
<tr>
<td>Mean Score</td>
<td>21.21</td>
<td>18.57</td>
</tr>
<tr>
<td>Standard Deviation</td>
<td>6.58</td>
<td>6.163</td>
</tr>
<tr>
<td>Mean Percentage Score (MPS)</td>
<td>53.08</td>
<td>51.57</td>
</tr>
</tbody>
</table>
However, the status quo between the two levels of performances in grade IV Mathematics and Mother Tongue-based test urges the need to strengthen the mastery of skills in Mathematics. Nevertheless, according to Dr. Benito (2010), DepEd NETRC Director, 75 MPS and above is the national target, which the performance level of the two variables fall short. At this 2nd quarter of school year, the pupils gain confidence and freedom to learn without any hesitation, to engage the lessons due to the MTBMLE. Nolasco (2008), as mentioned earlier, stated that the lingua franca has effectively helped children adjust to the school setting and learning tasks such as being able to read and write, solve math problems, understand science concepts and principle, use the first language at home and eventually English as a second language. Though Dr. Benito (2010) mentioned that 75 MPS as the national target, the results can enlighten the school administrators and teachers to scaffold the interest of the pupils to learn the lessons using the second language (L2). Dennis and Susan Malone (2011), in their study “Teacher Education for Mother Tongue---Based Education Programs”, concluded that teacher education is clearly an essential component of successful and sustainable MTB-MLE. They further said that relevant and useful collaborations among all stakeholders — communities, teacher training institutions, and government agencies—will help develop and maintain teacher training programs that will produce effective MTB-MLE teachers.

The average mastery level of performance in grade IV Mathematics is a sign that the respondents achieved better performance in a transition stage from mother tongue-based K-12 implementation starting from grade one to grade three and to the English-based medium of instruction as a second language (L2). However, it relays a message to the teachers that the respondents need more practice and proficiency in Mathematics skills to elevate the performance even up to mastery level.

The pupils’ performance in Mother Tongue-based test proves that the language barrier in the test questions—which was unleashed using Mother Tongue-based test—is understood by the respondents. Hence, the teachers effectively managed the smooth transition of Mother Tongue-based medium of instruction in Mathematics to English-based.

3. Significant Relationship between the Demographic Profile of the Respondents and: Grade IV 2nd Quarter Mathematics Periodical Test and Mother Tongue-Based Performance

Chi-square Test Results between the Demographic Profiles of the Respondents and the Level of Performance of Grade IV Mathematics. The data determine a significant relationship in the level of performance of grade IV Mathematics if the same is tested against the demographic profiles which include: type of community, ethnic group, mother tongue and family monthly income.

As to the type of community, the chi-square $p$-value is 0.044 with 0.05 level of significance and 4 degrees of freedom. The means of an urban and rural type of community are 51.47 and 61.40, respectively. There is a statistically significant relationship between the variables. It means that the frequency of the level of performance of grade IV Mathematics and the frequency of each type of community is most likely similar.
As to the ethnic group, the chi-square $p$-value is 1.00 with 0.05 level of significance and 4 degrees of freedom. The means of Bisaya, and Non-Bisaya ethnicity are 53.00 and 55.00, respectively. There is no statistically significant relationship between the two variables. It means that the frequency of level of performance of grade IV Mathematics and the frequency of each ethnic group is most likely not similar. Therefore, there is no enough evidence to say that the two are significantly related.

As to the mother tongue, the chi-square $p$-value is 0.302 with 0.05 level of significance and 4 degrees of freedom. The means of Binisaya and Non-Binisaya mother tongue are 53.08 and 45.00, respectively. There is no statistically significant relationship between the two variables. It means that the frequency of level of performance of grade IV Mathematics and the frequency of each language used are not similar, therefore, the two are not significantly related.

As to the family monthly income, the chi-square $p$-value is 0.112 with 0.05 level of significance and 12 degrees of freedom. The means of ‘9, 999 and below’, ‘10, 000 – 39, 999’, ‘40, 000 – 89, 999’, ‘90, 000 and above’ range of monthly income are 52.35, 54.40, 53.93 and 36.67, respectively. Thus, there is no statistical significance as to the family monthly income.

Chi-square Test Results Between the Demographic Profiles of the Respondents and the Level of Performance of Mother Tongue-based Mathematics Test. The data determine whether there is a significant relationship in the level of performance of mother tongue-based Mathematics if the same is tested with the demographic profiles which include: type of community, ethnic group, mother tongue and family monthly income.
As to the type of community, the chi-square p-value is 0.000 with 0.05 level of significance and 5 degrees of freedom. The level of performance in mother tongue-based Mathematics of an urban and rural type of community are 43.41 and 62.87, respectively. Thus, there is a statistically significant relationship as to the type of community.

As to the ethnic group, the chi-square p-value is 1.000 with 0.05 level of significance and 5 degrees of freedom. The level of performance in mother tongue-based Mathematics of Bisaya, and Non-Bisaya ethnicity are 46.45 and 41.25, respectively. It means that the frequency of level of performance of grade IV Mathematics and the frequency of each ethnic group are most likely not similar. Therefore, there is no enough evidence to say that the two are significantly related.

As to the mother tongue, the chi-square p-value is 1.000 with 0.05 level of significance and 5 degrees of freedom. The level of performance in mother tongue-based Mathematics of Binisaya, and Non-Binisaya are 55.00 and 46.35, respectively. There is a statistically significant relationship as to the mother tongue.

This is same as to their family monthly income, the chi-square p-value was 0.977 with 0.05 level of significance and 15 degrees of freedom. The level of performance in mother tongue-based Mathematics of ‘9, 999 and below’, ‘10,000–39, 999’, ‘40,000–89,999’, and ‘90, 000 and above’ family monthly income are 46.20, 47.58, 43.58 and 39.18, respectively. Thus, there is no statistically significant relationship as to their family monthly income.

For the type of community against the two dependent variables, it is better to use other methods to explore their interaction in a more detailed way. For this study, the researcher limits only to a fairly simple way of discussing the relationship between variables. However, Obasi (2011), in his study of “Urban-Rural Differential in Teaching and Learning of Geography in Ahiazu Mbaise and Owerri Municipal Council in IMO State”, concluded that students in the rural schools can perform equally well as those in the urban schools given the necessary qualified staff and equipment.
The level of performance of grade IV Mathematics is, therefore, not significantly related when tested against the demographic profiles (ethnic group, mother tongue, and family monthly income), except the type of community. Therefore, only the type of community, among other demographic profile of the respondents, was dependent on the level of performance of grade IV Mathematics. The level of performance of mother tongue-based Mathematics has, therefore, no statistically significant relationship as tested against the demographic profile (ethnic group, mother tongue, and family monthly income), except the type of community. This is consistent with the result in grade IV mathematics performance that only the type of community has a statistically significant relationship or most likely similar and dependent on the level of performance of Mother Tongue-based Mathematics.

The outcome of the performance of the English-based test is higher than the Mother Tongue-based test of this study and challenges the effectiveness of MTBMLE implementation. To justify this noticeable results, some factors are to be considered during the administration of the test such as teachers, pupils, environment and others. The instrument used by the researcher was also another factor to look into. However, the difference between the performance of English-based test and Mother Tongue-based test which is 6% dropped down from the average mastery achievement level and a decrease of 1.5 MPS occurred at the average mastery achievement level.

4. The Tests Scores of the Pupils in the English-Based Test and Mother Tongue-Based Test Compare when Grouped According to the Variables in Question Number 1

MANOVA Test Results of Scores of the Pupils in the English-based Test and Mother Tongue-based Test Compared when Grouped according to the Demographic Profile of the Respondents. The tables 9, 10, 11 and 12 present the result of the scores of the pupils in the English-based test and Mother Tongue-based test compared when they are grouped according to the type of community, ethnic group, mother tongue and monthly income of the respondents using multivariate analysis of variance (MANOVA). In this query, the researcher finds how the demographic profile of the respondents influences some patterning of responses on the scores of the pupils in the English-based test and Mother Tongue-based test.

In table 9, there is a statistically significant difference between urban and rural dwellers when considered jointly on the variables English-based test and mother tongue-based test, \( p = 0.000 \) with MANOVA evaluated at an alpha level of 0.05 and the means of 20.59 and 24.56, respectively for English-based.

The means of Mother Tongue-based urban and rural are 17.36 and 25.15, respectively. The respondents living in the rural demonstrated significantly higher on the English-based test and mother tongue-based test as well than in urban respondents.

Table 10 reveals that there is a significant difference between Bisaya and Non-Bisaya as an ethnic group when considered jointly on the variables, English-based test and Mother Tongue-based test, \( p = .000 \) with MANOVA evaluated at an alpha level of 0.05 and the means of 21.20 and 22.00, respectively. The means of Mother Tongue-based test are 18.58 and 16.50, respectively.
The data indicate that the Non-Bisaya ethnic group is significantly higher on English-based test than the Bisaya ethnic group while on the Mother-Tongue based test, the Bisaya ethnic group is significantly higher than the Non-Bisaya ethnic group.

### Table 9

<table>
<thead>
<tr>
<th>Independent Variables by Type of Community</th>
<th>Mean</th>
<th>Dependent Variables</th>
<th>MANOVA p - Value</th>
<th>Interpretation</th>
</tr>
</thead>
<tbody>
<tr>
<td>Urban</td>
<td>20.59</td>
<td>Scores in Grade IV 2nd Quarter Mathematics (English-based Test)</td>
<td>.000</td>
<td>statistically significant different</td>
</tr>
<tr>
<td>Rural</td>
<td>24.56</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Urban</td>
<td>17.36</td>
<td>Scores in Researcher’s Made-test Mathematics (Mother Tongue-based Test)</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Rural</td>
<td>25.15</td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

In the same way, table 11 shows that the Binisaya and Non-Binisaya are significantly different on English-based test and mother tongue-based test, $p = .000$ with MANOVA evaluated at an alpha level of 0.05 and the means of 18.00 and 21.23, respectively for English-based.
The means of Mother Tongue-based are 22.00, and 18.54, respectively. The data show that the Binisaya is significantly higher on English-based test than Non-Bisaya. Unlike the mother-tongue-based test, the results are reversed and Non-Binisaya is significantly higher than the Bisaya ethnic group.

Finally, table 12 discloses the result that the family monthly income is significantly different on the variables, English-based test and Mother Tongue-based test, $p = .000$ with MANOVA evaluated at an alpha level of 0.05 and the means are 20.95, 22.16, 21.57, and 14.67, respectively for English-based. The means on Mother Tongue-based are 18.50, 19.03, 17.43, and 15.67, respectively. The data on the ‘9,999 and below’ family monthly income demonstrate a significantly lower in the English-based test and Mother Tongue-based test than ‘10, 000 and above’ family monthly income.
Another perspective to ponder from this study is the comparison of the scores of English-based test and mother tongue-based test when grouped according to the type of community, ethnic group, mother tongue and monthly income of the respondents. Generally, the demographic profiles provide enough evidence that there is significant difference when compared jointly with the variables of English-based test and mother tongue-based test.

The results indicate that the demographic profile (type of community, ethnic group, mother tongue, and family monthly income) is significantly different on the level of performance of grade IV Mathematics and mother tongue-based Mathematics.

5. Whether there is a Significant Relationship between Respondents’ Performance in the Mother Tongue-based Examination and English-based Examination

**Bivariate Correlations Test Between Respondents’ Performance in the English-based Examination and Mother Tongue-based Examination.** In table 13, there is a significant positive relationship between scores on grade IV 2nd quarter math (English-based test) and scores of researcher made-test math (Mother Tongue-based), \( r (263) = .492, p = .000 \). The scattered dots are positive moderate correlation where \( r = .492 \). Finally, to test the null hypothesis, there is no significant relationship between respondents’ performance in the Mother Tongue-based examination and English-based examination based on the Pearson product-moment coefficient test, findings show that it is rejected with the \( r (263) = .492, p = .000 \). All theoretical premises mentioned earlier and related studies reviewed about the incorporation of MTBMLE in the formal education are strengthened by the result of this study. The government’s legal support in implementing K-12 MTBMLE program by making a law—RA 10533 which known as “Enhanced Basic Education Act of 2013”—is on the right track.

<table>
<thead>
<tr>
<th>Variables Correlated</th>
<th>Correlation Coefficient ( (r) )</th>
<th>( p )-Value</th>
<th>Verbal Description</th>
<th>Interpretation @ (0.05) Level of Significance</th>
</tr>
</thead>
<tbody>
<tr>
<td>Performance in Grade IV Mathematics (English-based Test)</td>
<td>.492</td>
<td>.000</td>
<td>positive moderate correlation</td>
<td>positive significant moderate correlation</td>
</tr>
<tr>
<td>Performance in Grade IV Mathematics (Mother Tongue-based Test)</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

Though this study limits only to the seven schools of Sibulan South Districts and cannot speak on behalf of the whole Sibulan District, a division of Negros Oriental and even to the national level, the results are considered as a good material to encourage other researchers to conduct a similar study focused on scaffolding the effectiveness in implementing MTB-MLE in the classroom and teacher training.

Finally, the correlation test between respondents’ performance in the English-based examination and Mother Tongue-based examination shows that the null hypothesis is rejected. Therefore, there is a significant relationship between respondents’ performance in the English-based examination and Mother Tongue-based examination.
Conclusions

Based on the results just presented, the following conclusions are herein formulated to answer the specific questions. Most of the respondents of this study are Bisaya with Binisaya as their mother tongue or first language (L1) and living in urban and rural areas, regardless of monthly income. Binisaya, as a mother tongue, was rooted down from their ethnicity of being a Bisaya as manifested in their demographic profile. Therefore, the mother tongue of the respondents, Binisaya, is the language of their hearts. Teachers are encouraged to maximize their creativity in producing Mother Tongue-based instructional materials (IM's), designing locale-based activities that would enhance the learners’ analytical ability and improve their problem-solving skills in a conducive environment where the second language (L2) is understood using the mother tongue (L1). Obviously, teacher education is clearly an essential component of successful and sustainable MTB-MLE.

The level of performance in grade IV Mathematics signals that the respondents achieve average mastery from mother tongue to the English medium of instruction as a second language (L2) in Mathematics. At the same time, it is closely similar to the performance in Mother Tongue-based test. Hence, the language barrier, as one factor in comprehending the test questions, is understood by the respondents due to the implementation of the K-12 MTB-MLE program. The school leaders recognize the relevant and useful partnership among all stakeholders such as parents, private training institutions, and government agencies, which will help develop and maintain teacher training programs that will produce effective MTB-MLE teachers. The Department of Education, among other government and private agency, shall collaborate in providing training for the teachers, the MTB-MLE implementer, to be competent in the required language, content and methods.

The test of independence between the level of performance of grade IV Mathematics and mother tongue-based Mathematics against the demographic profiles such as ethnic group, mother tongue, and family monthly income, except the type of community, is not statistically significant. Though the only type of community is dependent on the level of performance of two dependent variables, the need to use other methods is necessary in order to explore their interaction in more detailed way. The respondents’ profile itself is an important determiner for the decision-making phase of language teaching; hence, it is eagerly recommended that the government agencies, such as the Department of Education, DOST, and others, shall encourage and motivate the teachers to conduct a comparable study and use other methods to explore their interaction in a more detailed way. The Department of Education shall give motivational incentives to stimulate the teachers’ passion to make more action research to be done at the classroom level.

The test for the difference in two or more vectors of means between the level of performance of grade IV Mathematics and Mother Tongue-based Mathematics, when compared jointly with the demographic profile of type of community, ethnic group, mother tongue and family monthly income, demonstrates a significant difference. Therefore, the demographic profile of the respondents provides enough evidence to show the significant difference of scores in English-based test and mother tongue-based test. A parallel study be done in other districts in order to have triangulated results of the study.

The null hypothesis is rejected. Therefore, there is a significant relationship between the respondents’ performance in the English-based examination and Mother Tongue-based examination. Mother Tongue-based Multilingual Education (MTBMLE) includes more than the school and classroom.
It begins in the learners’ homes and communities. For future researchers, their study be focused on attitudes, interactions and perceptions of multiple stakeholders as well as on test scores.

References


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