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Teaching Geometrical Figures in Waray: The LNU-ILS Experience

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Abstract

Waray children are "unconsciously shifting from their mother language to English and/or Tagalog in their vocabulary use". English vocabularies are more familiar to Waray educands of today than are the indigenous Waray terms, for instance, for geometrical figures, colors, numbers, etc. Still, "it is an ongoing debate of what type of language should be used in the implementation of MTBMLE." Should educators use a Waray that borrows heavily from English and other languages or a Waray that uses exclusively its own indigenous terms and concepts? The researchers formulate a single lesson plan using an inductive method incorporating the Montessori Approach. Using Waray as the medium of instruction, the lesson is taught to two groups equivalent in number and composition: Group A (the experimental group) uses indigenous terms in the teaching of geometrical figures, and Group B (the control group) uses borrowed English terms in the teaching of geometrical figures. We have two types of pupils at LNU-ILS: Waray pupils whose language at home is Waray, and Waray pupils who are exposed to English at home. With this set up, the researchers tried to see if there are significant differences in achievement scores between the following: (1) Waray pupils versus English pupils within Group A; (2) Waray pupils versus English pupils within Group B; (3) Waray pupils from group A versus Waray pupils from Group B; (4) English pupils from Group A versus English pupils from Group B; (5) English pupils from group A versus Waray pupils from Group B; (6) Waray pupils from Group A versus English pupils from Group B; and (7) Group A versus Group B. T-test for independent samples is utilized as a statistical tool in the analysis of the achievement scores (post-test minus pre-test).

Keywords*: MTBMLE, Teaching Waray, Teaching Geometrical Figures in Waray, Vocabulary development in Waray, Intellectualization of Waray*

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Introduction

"There is an ongoing debate of what type of language should be used in an MTBLE program. Some would use existing popularly spoken words which might include borrowed words from other languages. Other would look for the original words used by their ethnic group. *For instance*, [t]he Lubuagan teachers believe that borrowed words...do not sound their own. The task in MTBMLE is to save [a marginalized] language... [and to support] the rebuilding of the vocabulary in their own language" [1].

Does this mean, however, that teachers have to do research vocabularies in the mother tongue to teach, for example, mathematical and scientific concepts? Or do the teachers have to borrow technical terms, say from English, to teach math and science, provided these are explained using the mother tongue?

To put it simply, are we going to use a type of language (the mother tongue) that heavily borrows vocabularies from English and other languages, or will we use a mother tongue that utilizes indigenous terms that are no longer used by the people, although these can be found in Waray/Bisayan dictionaries of references [2], [3], [4] and [5]?

These questions are very significant in the case of Waray children of today (ages 9 to 14) who are "unconsciously shifting from their mother language to English and/or Tagalog in their vocabulary use" [6]. Reference [7] claims that "children develop new knowledge and skills based on what they already know from their community and culture." However, in the case of Waray, for instance, the English word *square* and its Tagalog equivalent *parisukat* are more familiar to Waray educands of today than the equivalent indigenous term *dasag.*

This study tries to provide empirical evidence on what type of language should be used in the implementation of MTBMLE: Is it Waray with borrowings or Waray that uses its indigenous terms and concepts as exemplified in this study (the teaching of geometrical figures)?

Methodology

The subjects of this study are Kinder 1 pupils of Leyte Normal University-Integrated Laboratory School. Just like in the private elementary schools in the Eastern Visayas, pupils at LNU-ILS are of two types: Waray pupils whose language at home is Waray, and Waray pupils which are exposed to English at home. The later type, for the purpose of this study, is labeled English pupils. There are 26 participants in this study, which is the limitations of this study: thirteen (13) male, thirteen 13 female. The parents of these children have white-collar jobs. Many of them use English at home. However, it must be noted that the parents' L1 is still Waray. Some of the participants speak Waray. Their parents want these children to be exposed to English as early as Kinder 1, in the hope that they (the children) can learn the English language better. In this sense, LNU-ILS pupils are similar in characteristics to the pupils in private elementary schools in the region.

The researchers formulated a single lesson plan using an inductive method incorporating the Montessori Approach. The lesson was taught (using a Waray medium of instruction) to two equivalently composed clusters: Group A (the experimental group) uses indigenous terms in the teaching of geometrical figures [7 pupils whose L1 is Waray and 6 pupils who are exposed to English at home], and Group B (the control group) uses borrowed English terms in the teaching of geometrical figures [6 pupils whose L1 is Waray and 7 pupils who are exposed to English at home].

With this setup, the researchers tried to see if there are significant differences in achievement scores between the following: (1) Waray pupils versus English pupils within Group A; (2) Waray pupils versus English pupils within Group B; (3) Waray pupils from group A versus Waray pupils from Group B; (4) English pupils from Group A versus English pupils from Group B; (5) English pupils from group A versus Waray pupils from Group B; (6) Waray pupils from A versus English pupils from Group B; and (7) Group A versus Group B.

T-test for independent samples was utilized as a statistical tool in the analysis of achievement scores.

Review of Related Literature

Reference [8] defines the mother tongue as "a language or, languages which the child grows up with and the grammar of which the child has learned before school. In multilingual contexts, children may grow up with more than one language….[C]hildren often have more than one mother tongue when

several languages are spoken in the family of the child or in its immediate neighborhood. Thus, education could be made available in one of the first languages with which the child is familiar."

Still, this definition of reference [8] does not provide an adequate answer to the debate on what type of language should be used with regards to the present linguistic situation of the Waray educands. It is this area that this study primarily tries to address.

As far as the researchers are concerned, no study has yet been conducted particularly on the question of what type of language should be used in the implementation of MTBMLE. The following paragraphs describe previous research relevant to the present study: Reference [9] "examined the effect of using the native language (Waray) in the teaching of kindergarten mathematics" vis-a-vis the use of a second language as a medium of instruction. However, the concepts that were taught in this study are actually borrowed words from English and Spanish (i.e., onse, baynte, trayanggolo, etc.). Reference [9], therefore, uses a type of Waray that borrows heavily from English and other languages as medium of instruction. She concluded that, "the kindergarten pupils exposed to the "native language" performed better in mathematics than those who were exposed to English.

Yet, references [9], together with the studies that were conducted by references [10], [11], [12] and [13] would appear to have made the assumption that their subjects have strong L1 linguistic foundation. These studies are silent regarding the central question of this study. Waray children of today, as represented by the LNU-ILS pupils subjects of this research, are, ironically, more familiar with English and Tagalog vocabularies rather than with Waray vocabularies (again, see [6]). For example, as observed in the classrooms, most Waray children, and even adults today, use the words *rectangle*, *square*, *triangle*, etc. to describe shapes rather than use the Waray equivalent of those terms. This observation is also true when they discuss science, mathematics, and arts subjects.

Again, what type of language should be used in the implementation of MTBMLE: Waray with heavy borrowings from English and other languages, or Waray that uses its indigenous terms and concepts as exemplified in this study? This study uses autochthonous Waray terms in the teaching of geometrical figures. Will the use of Waray indigenous terms and concepts still be effective today?

Results

The distribution of the achievement scores of both groups are found to be normal using the Kolmogorov-Smirnov test for normality. Thus, t-test for independent samples is used to compare means of the achievement scores across groups.

The following tables are the summary of the SPSS outputs that will answer problems 1 to 7. Group A stands for the experimental group instructed using indigenous Waray terms. Group B stands for the control group instructed using English terms in the teaching of geometrical figures. Waray, in the tables below is used to refer to pupils whose language at home is Waray, and English is used here to refer to pupils who are exposed to English at home. That is, A-Waray refers to pupils whose L1 is Waray within Group A. A-English refers to pupils who are exposed to English at home within Group A. B-Waray refers to pupils whose L1 is Waray within Group B, and B-English refers to pupils who are exposed to English at home within Group B.

Table 1 shows that the different clusters acquire different achievement-score mean values; A-Waray pupils have the greatest mean value of 4.2857, and B-English pupils have the least mean value of 3.1429.

Table 1. Group Statistics by Cluster

Cluster	N	Mean	Std. Dev.	Std. Error Mean
A-Waray	7	4.2857	3.35233	1.26706
A-English	6	3.6667	2.42212	.98883
B-Waray	6	3.1667	3.18852	1.30171
B-English	7	3.1429	2.26779	.85714

Table 2. t-test Results Across Clusters

		Levene's Test for Equality of Variances		t-test for Equality of Means					95% Confidence Interval of the Difference	
		F	Sig.	T	Df	Sig. (2-tailed)	Mean Difference	Std. Error Difference	Lower	Upper
(1) A-Waray vs. A-English	Equal variances assumed	.983	.343	.375	11	.715	.61905	1.65007	-3.01274	4.25083
	Equal variances not assumed			.385	10.749	.708	.61905	1.60724	-2.92855	4.16665
(2) B-Waray vs. B-English	Equal variances assumed	3.494	.088	.016	11	.988	.02381	1.51613	-3.31317	3.36079
	Equal variances not assumed			.015	8.884	.988	.02381	1.55857	-3.50895	3.55656
(3) A-Waray vs. B-Waray	Equal variances assumed	.078	.785	.613	11	.552	1.11905	1.82420	-2.89600	5.13409
	Equal variances not assumed			.616	10.848	.551	1.11905	1.81656	-2.88602	5.12411
(4) A-English vs. B-English	Equal variances assumed	.028	.869	.402	11	.695	.52381	1.30141	-2.34058	3.38820
	Equal variances not assumed			.400	10.430	.697	.52381	1.30861	-2.37576	3.42338
(5) A-English vs. B-Waray	Equal variances assumed	2.663	.134	.306	10	.766	.50000	1.63469	-3.14232	4.14232
	Equal variances not assumed			.306	9.329	.766	.50000	1.63469	-3.17815	4.17815
(6) A-Waray vs. B-English	Equal variances assumed	1.002	.337	.747	12	.469	1.14286	1.52975	-2.19018	4.47590
	Equal variances not assumed			.747	10.541	.471	1.14286	1.52975	-2.24209	4.52780

However, **Table 2** shows that these differences of the mean values across clusters are not significant. The Levene's test for equality of variances implies that equal variances should not be assumed (p value > 0.05). That is, (1) There is no significant difference in the performance between Waray pupils versus English pupils within Group A (t value = 0.385, p value > 0.05); (2) There is no significant difference in the performance between Waray pupils versus English pupils within Group B (t value = 0.015, p value > 0.05); (3) There is no significant difference in the performance between Waray pupils from group A versus Waray pupils from Group B (t value = 0.616, p value > 0.05); (4) There is no significant difference in the performance between English pupils from Group A versus English pupils from Group B (t value = 0.400, p value > 0.05); (5) There is no significant difference in the performance between English pupils from group A versus Waray pupils from Group B (t value = 0.306, p value > 0.05); and (6) There is no significant difference in the performance between Waray pupils from group A versus English pupils from Group B (t value = 0.747, p value > 0.05).

Furthermore, **Table 3** below shows that pupils taught in Group A have a higher achievement-score mean value of 4.0 than that of pupils taught in Group B, theirs being a mean value of 3.1538.

Table 3. Group Statistics by Group

Class	N	Mean	Std. Dev.	Std. Error Mean
Group A	13	4.0000	2.85774	.79259
Group B	13	3.1538	2.60916	.72365

However, consistent with our statistical data, this mean difference is not significant as shown in **Table 4**. That is, there is no significant difference in the performance of Group A pupils taught in a more exclusive version of Waray that uses indigenous Waray terms and concepts regarding geometry when compared with Group B pupils taught in an inclusive version of Waray that borrows English terms for geometrical figures (t value = 0.788, p value > 0.05).

Table 4. t-test Results Across Groups

		Levene's Test for Equality of Variances		t-test for Equality of Means						
									95% Confidence Interval of the Difference	
		F	Sig.	t	df	Sig. (2-tailed)	Mean Difference	Std. Error Difference	Lower	Upper
Group A vs. Group B	Equal variances assumed	.042	.840	.788	24	.438	.84615	1.07325	-.36893	3.06124
	Equal variances not assumed			.788	23.804	.438	.84615	1.07325	-.36990	3.06221

Discussion

The pupils in both Group A and Group B performed well. Both classes got high scores in their post tests. Both also showed improvements if we compare their respective pre-tests and post-tests scores. However, there is no significant difference in the achievement scores between Group A and Group B.

If Group A's achievement scores has no statistical significant difference with that of Group B, given also the fact that they both scored relatively high in the post test, it can be argued that Waray indigenous concepts can be used in the classroom. In other words, the use of Waray geometrical concepts is as good as the utilization of English terms.

This suggests, moreover, that the use of indigenous concepts in the teaching of science and mathematics are consistent with the essence of MTBMLE. Reference [14] recognizes that "MTBMLE *should* facilitate learning without loss of cultural and linguistic heritage." By using indigenous concepts in the teaching of science and mathematics, the students are also given the opportunity to rediscover and learn their own culture. Also, the use of indigenous concepts in the teaching of science and mathematics will also contribute in the vocabulary development and intellectualization of Waray language. "Local languages *must be* used not simply because children learn faster through them than through unfamiliar languages, but also because the local development needs of the people require that their local languages be used"[15]. To use borrowed terminologies from English and other languages in the implementation of MTBMLE would undermine the fundamental nature of Mother Tongue-Based Multilingual Education itself.

Conclusion & Recommendations

There is no significant difference in the performance between (1) Waray pupils versus English pupils within Group A; (2) There is no significant difference in the performance between Waray pupils versus English pupils within Group B; (3) There is no significant difference in the performance between Waray pupils from group A versus Waray pupils from Group B; (4) There is no significant difference in the performance between English pupils from Group A versus English pupils from Group B ; (5) There is no significant difference in the performance between pupils from group A versus Waray pupils from

Group B; and (6)There is no significant difference in the performance between Waray pupils from group A versus English pupils from Group B.

There is no significant difference between Group A and Group B classes in terms of learning achievements.

With Mother Tongue as the medium of instruction, the use of indigenous Waray concepts in teaching geometrical figures is as effective as the use of borrowed terms in English and other languages. The results prove that Waray indigenous concept can be utilized in teaching science and mathematics.

We recommend, therefore, that in the implementation of MTBMLE in the Waray speaking areas of Eastern Visayas, indigenous concepts should be utilized in the teaching of science and mathematics, rather than borrow technical concepts heavily from English and other languages. Exceptions must be made, however, to technical terms that cannot be found in Waray.

We also recommend that the same study be conducted in a rural school area to verify the results.

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