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Change of "Tongue" from English to a Local Language: A correlation of Mother Tongue Proficiency and Mathematics Achievement

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Abstract

Significant consequences are results of mere decision on determining the language of instruction specifically in the early years of education. It means that rightful language choice leads to educational success. Contrariwise, an inappropriate selection of a language proves to be detrimental in the taking place of learning. With the recent language policy shift from English to Mother tongue (MT), in the context of the Philippines, as medium of instruction in the teaching of mathematics in early grades, this study examined how language proficiency in the MT relates to mathematics achievement. Study participants include 71 grade 2 students aged 6-8. The findings show that the respondents' mean achievement in mathematics and their mean proficiency in the MT are both described as '*advanced*'. Moreover, it was revealed that there is a very strong positive correlation between the respondents' achievement in mathematics and proficiency in the MT.

Keywords: Mother Tongue, Mathematics, K-12, Medium of Instruction, Policy Planning

1. Introduction

1.1 Background of the study

The essential role of language can never be overemphasized in the learning of students as most acquisition of knowledge and learning of skills are realized through the aid of language (Casil-Batang & Malenab-Temporal, 2018). Therefore, Ejieh (2004) maintains that language in education is not a simple but a crucially essential concern. Significant consequences are results of mere decision on determining the language of instruction specifically in the early years of education. It means that rightful language choice leads to educational success. Contrariwise, an inappropriate selection of a language proves to be detrimental in the taking place of learning. It is a reasonable conclusion that success of any educational process relies much on the language to be used because it is a tool in the transmission of knowledge. The language of instruction plays a crucial role in the learners' educational development, and is essential in the realization of communication and understanding between and among teachers and students (Ejieh, 2004).

In relation to this, Moschkovich (2002) argued that learner's first language can serve as a resource that can be capitalized for them to be able to communicate mathematically. Additionally, not a few but most research on mathematics educaton which have investigated multilingual classrooms support the use of MT (Setati, 2008). Moreover, Moschkovich (2002) contends that the ability to communicate is central to learning mathematics in school. By this

reason, it is best to teach young learners in their home language or L1 (Mackenzie, 2009). In a similar vein, Young (2009) asserts that there is a need for the languages of children and the languages of instruction to connect. Unless so, education will then be less effective.

Notwithstanding research-based supports for the use of MT in teaching subjects like mathematics and other content areas, penchant for English language as medium of instruction (EMI) remains true for parents, for the learners themselves, and for the whole educational institution. In fact, children's mother tongues (MTs) are not chosen to be the language of education (UNESCO, 2011).

Moschkovich (2002) reports that in South Africa there exist a general view that parents want their children to be educated in English, and that most learners wanted to be taught in English too. The same author noted that many schools in Africa choose English as the medium of instruction, and that the performance of African learners in mathematics is characterized to be poor.

Comparatively, Igboanusi (2008) recounted that the low achievement of students in Nigeria roots from the pre-mature use of English as a medium of instruction. He affirms the abrupt transition from MT to English caused an interruption in the cognitive and academic development of children explaining the poor achievement of students.

Subsequently, numerous researches highlight the importance and advantages of the use of MT especially in early education. The longitudinal study of Thomas and Collier (1997), conducted across states in America, produce profound results on the impact of MT use in the schooling of learners. It was found out in their study that children of language minority, in the long term, gained advantage from academic work set in their L1. The researchers reported:

> *"The more children develop L1 academically and cognitively at an age appropriate level, the more successful they will be in academic achievement in L2 by the end of their school years* (p.49)".

> *"Of all the five program variables, L1 support explains the most variance in student achievement and is the most powerful influence on LM (Language Minority) students' long term academic success* (p.64)".

Students instructed in L1 are noted to academically succeed. In addition, the researchers warn against "*cognitive or academic slowdown* (p.77)" which happens when students are yet

to fully develop proficiency in their L1 but have abruptly transited to learning a second language (L2). Results of the study further reveal that students taught in their L1 were better as compared to those children taught in L2 only or educated in their L1 for a very short of time. Identically, African students exposed to a language of instruction (LoI) that is not their MT have relatively low academic achievement especially students who had rare exposure to English (Graham, 2010). Williams (1993 cited in Graham, 2010) adduces students' poor ability to comprehend the LoI , which is English, as cause of their mediocre academic standing.

The Philippines is no exception to practices that seem to over value English; hence, the country has just recently heed the call for the use of mother tongue in the education of children in the primary years since the United Nations Educational, Scientific and Cultural Organization first made the call in 1953 which is approxiamately 65 years ago (UNESCO, 1953). It must be noted that the performance of Filipino learners in Mathematics during the years when English was used as MoI in teaching is characterized to be far from being ideal as the students achievement compared to other learners from other countries.

The reshaping of language lanscape in education in the Philippines eventuates from the enactment of the bill into law, the Republic Act 10533 otherwise known as the Enhanced Basic Education Act of 2013. The language provision of the law includes the use of MT as medium of instruction in all subject areas such as Mathematics from pre-kindergarten throughout grade 3 while Filipino and English are taught as distinct subjects.

It has been about five (5) years from the first implementation of MT as MoI in content subjects. Owing to the benefits in teaching using MT as language of instrution, this study aimed to lend support to the benefits of teaching in MT, specifically in Mathematics. The study is set in three directions. First is to determine the language proficiecny of the respondents in Mother Tongue. Second is to determine the respondents' achievement in mathematics. Last and the main focus of the study is to establish whether or not a relationship between language proficiency in MT and achievement in Mathematics can be drawn.

1.2 Review of Related Literature

1.2.1 The Mother Tongue-based Multilingual Education

Lawton (1973, in Ejieh, 2004) explained that the ability to communicate through language is unique to human, and such is a mean to attain learning and creative thinking. In education, the language choice for instruction generally plays a vital role, as the chosen language can either

serve as a key to understanding or a barrier of learning (Orwenjo, 2012). Similarly, Gorgorió, and Planas (2001) claimed that language as medium of learning mathematics is an essential area of investigation.

UNESCO (2013) provides an array of delineation for the term mother tongue as *"(1) the language/s that one has learnt first; (2) the language/s identifies with or is identified as a native speaker by others; (3) the language/s one knows best, and (4) the language/s one uses most*" (p.15).

Further, mother tongue-based education generally means realizing instruction through the use of the learners' first language (L1) or primary language in the early years of education (UNESCO, 2011); hence, also known as the 'first language first approach' (Orwenjo, 2012). This means that the language of instruction is the one that children have first learned or the language of the home. Discussions, lectures, instructions, and recitations inside the classrooms are therefore done in children's L1 which enables the interaction between learners and their teacher and even among themselves to happen more naturally (Benson, 2004) and freely (MacKenzie, 2009) resulting to a strong classroom participation (Dutcher, 1995 in Burton, 2013).

Instruction of the reading and writing literacy including content is done in a language to which the learner is proficient. Learning of other languages, the second language (L2) and the third language (L3), will be done systematically after the grounding of competence in the L1 of young learners. This practice would allow the transfer of both literacy and knowledge from L1 to another language/s (L1, L2). After the mastery of the first language another language is added to be learned, making this to be known as 'additive approach' (Orwenjo, 2012).

The non use of home language fosters difficulty to learners. Educational systems that do not account the use of children's home language in their early education expect young schooling children to learn a new language alongside learning content which proves to be too difficult if not improbable to fulfill (Jhingran, 2005 in MacKenzie, 2009). This becomes particularly true in study of mathematics taught in English to English language learners (ELL) as it was confirmed that there exist a so-called language-associated difficulties (Lee & Jung, 2004). Moreover, it is further claimed that non-mother tongue-based schooling imposes constraints to learners' acquisition of knowledge and learning of skills. This is because understanding the language of instruction becomes a task in itself in cases where the learners

are yet to master the medium of instruction. This is essentially true with respect to the subject mathematics as learning the said subject is noted to be a two-way process The first is to understand the math concepts being taught, and the second is to be able to communicate such understanding (Gerber , Engelbrecht, Harding, & Rogan, 2005). To the both processes pointed, language plays both central and vital roles. Therefore, the language of instruction proves to be very important for learners to be able to relate to happenings during class hours, and there would be no other best way for children to learn other than being taught in their mother tongue (UNESCO, 2011).

1.2.2 Benefits of Mother Tongue as MoI

The school use of L1 is claimed to be beneficial to cognitive development. Illustrative of this is the research of Trudell and Shroeder (2007) as regards African students in their study. One notable explanation to the academic success of students in the study gained when instructed in their L1 is alluded to the idea that when classrooms do not cut off children from their home language, instead nurture it, their language as well as culture finds a place inside the classroom which become resources they can capitalize on and take advantage for learning (Orwenjo, 2012). In teaching mathematics problem, a similar perspective is expressed by Robertson (2009) when he claimed that integration of real-life example, the kind that is immediate to the child, makes mathematics problems comprehensible. One good example is the finding of Cook (2001 in Tabari & Sadighi, 2004) who informed that the use of L1 have been claimed by teachers to help students become conscious of the differences and similarities between their own language structure and that of another language which paves way for accurate translation.

Moreover, the practice that allows the language of children along with their culture to occupy essential space in the basic curriculum enables children to learn context, ideas and concepts known to them and later would be bridge to a wider world. It must be noted that educational processes that account children's immediate environment and experience is supreme in so far as learning of children is concerned (Mackenzie, 2009), and because of this cognitive development happens more efficiently in children taught in their own language (Kembo, 2000).

Furthermore, instructions in the MT have been found to facilitate the affective development among children. The development of the affective domain among children is realized effectively because it was found that L1 education affirms children's self worth and identity which are bedrocks of learning (MacKenzie, 2009). Cummins (2000) maintained that

the use of L1 inside the classrooms allows not only the language of the home to find place in school but also the culture accompanying it which is a form of empowerment, and is a powerful instrument to be used in determining societal roots which forms part of one's identity (Indele, 2002 in Ngunga, 2011) boosting esteem and self pride as result of the feeling that one's culture and background matter. Consequently, multilingual education "*supports maintenance of cultural identity*" (Burton, 2013, p.43).

Apart from the potency of L1 instruction on children's cognitive and affective development and academic achievement, the delivery of early education in MT is found to succor language acquisition and learning. Skutnabb-Tangas and Toukomaa (1976 cited in UNESCO, 2011) postulate that the treshold of competence in children's L1 must be first attained before successful L2 learning can materialize which is the main assumption of their "*threshold level hyphothesis*." Constructing on this, Cummins (1984) developed his "*interdependence hyphothesis*" avowing the dependence of L2 competence on the proficiency level of the L1. This means that foregrounding children in MT facilitates the learning and use of other languages. This being the case, proficiency in the L1 is a predictor of the proficiency in L2 (Cummins, 2000). Mackenzie (2009) and Orwenjo (2012) echo the same contention and explains that as learners have solid foundation in their first language learning of other languages becomes easy. Conversely, failure to develop children's proficiency in the L1 compromises linguistic proficiency in the additional languages children are learning (Igboanusi, 2008).

1.2.3 Mother Tongue and Mathematics

Anstrom (1997) contends that "…*the importance of language in mathematics instruction is often overlooked in the mistaken belief that Mathematics is somehow independent of language proficiency*… (p.25). Therefore, by way of implication, the linguistic demand of the LoI in teaching mathematics is discounted by many educators. This practice is worth lamenting considering that students fail not because of weak mathematical ability or inability to perform operations or solve problems, but because the LoI served as a barrier proving to be too difficult to hurdle for many leaners.

Secada (1992) argues that central to the process of mathematical reasoning and activities such as explaining, making claims and providing proofs is language. This implies not only that language is important to fulfill different activities realized inside a mathematics class, but also the necessity for students to possess proficiency in the LoI for them to get passing or

better grades in mathematics. It is therefore not a surprise that learners with limited LoI proficiency have difficulties learning mathematics and are eventually poor performers. Rollnick (2000) explains a similar contention for learning another content subject like mathematics, science. He notes that "*It is acknowledged that expecting students to learn a new and difficult subject through the medium of a second language is unreasonable, giving them a double task of mastering both science content and language* (p. 100)".

In the context of first language or MT being important in Mathematics, the study of Dawe (1983) ,which enlisted as participants 11-13 years old children who are bilingual Punjabi, Mirpuri, Italian and Jamaican, found that competence in L1 is an essential factor in developing children's ability to reason in mathematics when the same is taught in English. This finding provides a considerable support that the use and benefit in other language can only be fully achieved if the first language is founded well. In a similar vein, Skutnabb-Tangas and Toukomaa (1976 cited in UNESCO, 2011) postulated that the treshold of competence in children's L1 must be first attained before successful L2 learning can materialize. This means that foregrounding children in MT facilitates the learning and use of other languages.

Moreover, Mackenzie (2009) and Orwenjo (2012) echo the same contention and explained that as learners have solid foundation in their L1, learning of other languages becomes easy. Conversely, failure to develop children's proficiency in the L1 compromises linguistic proficiency in the additional languages children are learning (Igboanusi, 2008). However, the hard truth remains that children across the world often master mathematics through a L2 or L3 (Gerber et.al., 2005) which is regarded as a common situation especially to developing countries (Clarkson, 1992).

There are studies that examined languages other than English that might affect mathematics learning in that particular language. In the study of Han and Ginsburg (2001), the result proves that using Chinese terminology makes concepts of mathematics "clearer' as compared to discussing the same concepts with English. This study lends proof that counters reported beliefs that indigenous languages are linguistically limited, and could not deliver the teaching of modern concepts which the English language can (Orwenjo, 2012).

1.3 Research Questions

The study mainly purposes to determine the relationship between the respondents' Mother tongue proficiency and mathematics achievement. Specifically, this study sought to answer the following questions:

1. What is the MT proficiency level of the respondents?
2. What is the level of mathematics achievement of the respondents?
3. Is there a significant relationship between the level of MT proficiency and level of mathematics achievement of the respondents?

Hypothesis of the study

H_o: There is no significant correlation between the level of MT proficiency and the level of mathematics achievement of the respondents

2. Methodology

2.1 Research design

The study employed a descriptive, correlational, non-experimental, and cross-sectional research design. Johnson (2000) claimed that a study with a primary objective of describing the phenomenon is classified as a descriptive study. The current study involves no use treatment or intervention but intends simply to describe the variables involve, and no comparable groups were established hence characterized as descriptive and non-experimental (Thompson, 2007). Moreover, the gathering of the data was done for a relatively short period of time, hence regarded as cross-sectional (Setia, 2016).

2.1 Participants and Setting

A total of 71 second graders with age ranging from 6 to 8 were enlisted to form part of the sample of the study. The students were enrolled in an elementary public school which is in full compliance on the use of MT as dictated by the K-12 curriculum. Forty (40) or fifty six percent (56%) are females. The mean age for the female subjects is 7.071 (SD = 0.539) and for the males is 7.156 (SD = 0.601).

2.2 The Data

The data sources of the study were the report cards of the students. The level of proficiency in the mother tongue is determined through the grades of the respondents in the subject MT. Likewise, the mathematics achievement of the students is identified through their grades in the subject math. To determine the average grades for mother tongue and mathematics, computation of the grades in the two subject areas for four (4) rating periods was done.

2.3 Procedure

Permission to collect data from two (2) class advisers was secured from the elementary school principal. Upon approval, a meeting was set for the researchers to discuss the nature of the study with the concerned teachers. The teachers were then instructed to furnish copy of the consolidated grades of the respondents. Only the grades in mother tongue and in mathematics asked to be provided. Further, the teachers were informed to identify no names of the students in the list for ethical consideration. Instead, a code should be assigned to be used simply for referencing purposes. After two weeks, the researchers returned to the research site for the collection of the data. The data then were then transferred to SPSS for analysis.

2.4 Method of analysis

The average for the grades of the respondents in the two subjects was computed. In order to produce the general mother tongue proficiency level of the respondents, the mean grade was computed.

To give interpretation to the grades, the following descriptions as provided by the Department of Education (Ronda, 2012) were used: Grades below 75% are described as beginning level (B), grades ranging from 75% to 79% are noted as developing level (D), grades from 80-84 are characterized as approaching proficiency level (AP), grades from 85 to 89 are labelled as proficient (P), and grades 90 and above are designated as advanced (A).

Moreover, to determine whether there was a significant correlation between the respondents' proficiency in mother tongue and mathematics achievement, Pearson *r* Correlation was employed.

3. Results and Discussion

3.1 General Mother tongue proficiency level of the respondents

The mean score of the grades of the respondents in the Mother tongue was computed and presented in Table 1. The Standard Deviation (SD) and interpretation are also provided for reference. The grade of the respondents in the subject mother tongue ranges from 83 - 97.

Table 1

General Mother tongue proficiency level of the respondents

Variable	Mean	SD	Interpretation
Mother tongue proficiency level	91. 324	3.617	Advanced

Note: Below 75% - Beginning; 75 to 79 – Developing; 80 to 84 – Approaching Proficiency; 85 to 89 – Proficient; 90 and above – Advanced

Table 1 shows, on the average, the students are '*advanced*' with regard their level of proficiency in MT. As evidenced by the finding showed, the students are performing very well in learning the MT. The possible explanation for the high level of MT proficiency among the respondents is the cyclical reinforcement that occurs.

The school is reinforced by the home, and the home is assisted as regards the learning of MT by the school. Because the school does not disconnect children from their MT as the same is used as a medium of instruction and as a content or subject area, the home becomes an avenue for the further use and development of competence in the MT. Similarly, language learning in school as regards MT is strengthened by home because language use and practice does not end in school, as what usually happens to L2 or L3 as in the case of African students reported by Graham (2010), instead continued at home and to an extent in the community.

Another reason for the high level of proficiency of students in MT is the empowerment that occurs in school. When students' MT is accepted, students' culture is also recognized. This results to the boosting of students' self worth accounted to be a form of empowerment in itself (Cummins, 2000), and is considered as a bedrock of learning (MacKenzie, 2009).

Furthermore, one is generally positive in learning one's own language (González-Riaño, Hevia-Artime & Fernández-Costales, 2013). This positivity can be inferred to be influenced by ethnic loyalty (Ndhlovu, 2010). It is therefore predictable to find that students in this study are doing well in learning their L1.

3.2 General mathematics achievement level of the respondents

Grades in Mathematics from four rating period were computed for average. To determine the general mathematics achievement level of the respondents, the mean was computed for the

average grade of the students. Table 2 presents the Mean, SD and interpretation as regards the students' achievement in math. The grades of the respondents in math ranges from 81 - 97.

Table 2

General mathematics achievement level of the respondents

Variable	Mean	SD	Interpretation
Mathematics achievement level	90.803	3.991	Advanced

Note: Below 75% - Beginning; 75 to 79 – Developing; 80 to 84 – Approaching Proficiency; 85 to 89 – Proficient; 90 and above – Advanced

As presented in Table 2, the respondents, in general, are with remarkable standing in terms of their mathematics grades. For students able to achieve well in mathematics according to Gerber et.al. (2005), understanding the mathematics concepts discussed or taught must be well grasped. Further, they need to be able to express effectively what they have understood, written or spoken.

The mean grade described as '*advanced*' can be taken to imply that students are able to understand math ideas presented by their teachers. The understanding of these concepts became possible because the language used for instruction is known to the young learners. This corroborates with the views that learners' first language can be capitalized by them to be able to communicate mathematically (Moschkovich, 2002).

Furthermore, since the language being used is the children's mother tongue, the learners are relieved of one difficulty and that is learning another language that Jhingran (2005, in MacKenzie, 2009) claimed to be a task difficult to fulfill by young learners when set alongside with the expectation of learning concepts. In the case of the respondents of this study, their favourable performance in Mathematics can be taken to mean that because the language of instruction did not serve as a barrier of learning (Orwenjo, 2012) instead facilitated understanding and learning.

MacKenzie (2009) reported educational outcomes of students whose language is not used as MoI to be described to be inferior as conpared to those whose language are used in schools. This study corroborates with the said findings in the sense that since students of this study are instructed in their L1 they are able to perform well because they are able to relate with discussion in class (UNESCO, 2011) and able to communicate among peers and their

teacher ((Ejieh, 2004) resulting to strong classroom participation (MacKenzie, 2009) making the subject interesting and attendance to class inviting.

3.3 Correlation between the respondents' Mother tongue proficiency level and mathematics achievement level

The mean grades for the MT and mathematics were computed. The relationship between the mother tongue level of proficiency and mathematics achievement level was determined. Table 3 provides the correlation matrix between the determined variable.

Table 3

Correlation: Mother tongue proficiency level and mathematics achievement level

Variables	*p*-value	*r*-value	Interpretation
Mother tongue proficiency level and mathematics achievement level	.000**	0.827	significant

Note: **significant at alpha = 0.01

Table 3 shows the correlation between the variables mother tongue proficiency level and mathematics achievement. The data (*p*-value = 0.000) shows that there is a significant correlation between MT proficiency level and mathematics level achievement. Therefore, the null hyphothesis is rejected. Moreover, the relationship (*r*-value = 0.827) is described as 'high correlation'. This pronounced relationship means that proficiency in MT predicts mathematics achievement when the language of instruction for math is MT. This finding means that students who have high MT level of proficiency are also the ones who have attained high level of mathematics achievement. Conversely, those who gained low proficiency in MT are also the ones who have low mathematics achievement.

This result is taken to mean that because children are taught in a language known to them, they are able to make sense of the concepts discussed in the classroom. Moreover, because as children's language finds place in the classroom, the culture that comes along with

language is given an essential space during class activities (Cummins, 2000). This is to mean that contexts and examples used inside mathematics classes are within the immediate experience of children, making such educational experience supreme (Mackenzie, 2009). In addition, this the makes all discussions and lessons afforded to students relatable.

On the other hand, this finding opposes the ideology that mother tongues are linguistically limited, and that the English language is the best medium to use for presentation of concepts and ideas to different subjects areas such as mathematics (Orwenjo, 2012). This result provides a contrary result to such belief. As evidenced by the result, the study confirms that mathematics concepts can be well presented and discussed in languages other than English. This finding supports the claim of Han and Ginsburg (2001) that for their Chinese respondentst math concepts are sometimes more clearly explained in the language of the students than in English.

4. Conclusions

Although the study was conducted in the context of a specific locale in the Philippines, the concern and issue on language-in-education is true and relevant to all.

The study provides promising finding with respect to the benefits of teaching mathematics in the mother tongue of young learners as provided by the result that students with high level of proficiency in the mother tongue perform well in mathematics when it is taught in the L1 of students. This study lends proof that MT as medium of instruction, contrary to beliefs overrating English and devaluing mother tongues, is a plausible choice as language of instruction.

Further, although the language shift is noted to be unpopular to parents and even to learners themselves because of prevalent preference for English due to its perceived economic value (Tupas, 2015), the study provides empirical result that points to an academic gain that is possible when children's Mother tongue is utlized as LoI. This further implies that the reshaping of the educational linguistic landscape in the country which has provided opportunity for MTs to take important spaces in the early education curriculum is an educational reform that is both long overdue and promising.

Overall, the finding of the study add to the literature that supports L1 as a more potent language to be used in the instruction of young learners.

5. Pedagogical Implications

The finding of the study provides educational implications, the primary are as follows:

One, the result of the study supports that mother tongues are linguistically sufficient to serve as LoI. It means that their use in content subjects such as mathematics unloads students with the burden of the task of mastering a language set alongside the task of learning the concepts taught in the subject areas which results to better academic performance. This further means that the founding of L1 proficiency becomes a bedrock upon which future academic sucesses would be founded. Therefore, basic education teachers, specifically the primary educators must labour to develop the level of MT proficiency of the learners.

Two, efforts must be set not only to merely translate versions of reading materials of foreign context. Instead, develop teaching resources that allow the culture and immediate experiences of students to be discussed and learned inside the classroom. This would make the concepts both concrete and relatable. This practice would mean capitalizing and giving merit to the knowledge students obtain before going to school, and to the information continously attain from the home and environment which is a hallmark of quality of early education.

References

Anstrom, K. (1997). Academic achievement for secondary language minority students: Standards, measures and promising practices. Washington, DC: National Clearinghouse for Bilingual Education

Benson, C. (2004). Do we expect too much from bilingual teachers? Bilingual teaching in developing countries. *International Journal of Bilingual Education and Bilingualism*, 7 (2), 204-221.

Burton, L. (2013). Mother Tongue-Based Multilingual Education in the Philippines: Studying Top-Down Policy Implementation from the Bottom Up. Retrieved Online.December 2, 2016. (Unpublished Ph.D. thesis), University of Minnesotta. Retrieved from https://conservancy.umn.edu/bitstream/handle/11299/152603/Burton_umn_0130E_13632.pdf.

Casil-Batang, P.G., & Malenab-Temporal, C. (2018). Language attitude and English proficiency of ESL learners. *Asian EFL Journal*, 20 (2), 186-2005.

Clarkson, P. C. (1992). Language and mathematics: A comparison of bilingual and monolingual students of mathematics. *Educational Studies in Mathematics*, 23 (4), 417 - 429.

Cook, V. (2001). Second language learning and language teaching (3rd ed). In F.Tabari & F. Sadighi. (2014). Bilingual education : from theory to practice. *Modern Journal of Language Teaching Methods*, 4 (2), 310-322.

Cummins, J. (1984). *Bilingualism and special education: Issues in assessment and pedagogy.* Clevedon, UK: Multilingual Matters Limited.

Cummins, J. (2000). Language, power, and pedagogy: Bilingual children in the crossfire. *Clevedon, UK: Multilingual Matters,* http://www.iteachilearn.com/cummins/mother.htm.

Dawe, L. (1983). Bilingualism and mathematical reasoning in english as second language. *Educational Studies in Mathematics*, 14 (4), 325-353.

Dutcher, N. (1995). The use of first and second languages in education. A review of international experience. In Burton, L. (2013). Mother Tongue-Based Multilingual Education in the Philippines: Studying Top-Down Policy Implementation from the Bottom Up. Retrieved Online.December 2, 2016. (Unpublished Ph.D. thesis), University of Minnesotta. Retrieved from https:.

Ejieh, M. U. (2004). Attitudes of student teachers towards teaching in mother tongue in Nigerian primary schools: implications for planning. *Language, Culture and Curriculum*, 17 (1), 73-81.

Gerber, A. , Engelbrecht, J. , Harding, A., & Rogan, J. (2005). The Influence of Second Language Teaching on Undergraduate Mathematics Performance. *Mathematics Education Research Journal*, 17 (3), 3-21.

González-Riaño, X., Hevia-Artime, I., & Fernández-Costales, A. (2013). Language attitudes of Asturian students in the area of Navia-Eo (Spain). *Language and Intercultural Communication*, 13 (4) , 450-469, doi: 10.1080/14708477.2013.785558.

Gorgorió, N., & Planas, N. (2001). Teaching mathematics in multilingual classrooms. *Educational Studies in Mathematics*, 47 (1), 7-33.

Graham, B. E. (2010). Mother tongue education: necessary? Possible? Sustainable?. *Language and Education*, 24(4), 309-321. doi:10.1080/09500781003678696.

Han, Y., & Ginsburg, H. P. (2001). Chinese and english mathematics language: the relation between linguistic clarity and mathematical performance. *Mathematical Thinking and Learning*, 3 (2), 201-220.

Igboanusi, H. (2008). Mother tongue-based bilingual education in Nigeria: attitudes and practice. *International Journal of Bilingual Education and Bilingualism*, 11 (6), 721-734.

Indele, F. (2002). Language problems of developing nation. In Ngunga, A. (2011). Monolingual education in a multilingual setting: The case of Mozambique. *Journal of Multicultural Discourses*, 6 (2),177-196.

Johnson, B. (2000). Toward a New Classification of Nonexperimental Quantitaive Research. *Educational Researcher*, 30 (2), 3-13. doi:10.3102/0013189x030002003.

Jhingran, D. (2005). Language disadvantage: The learning challenge in primary education. DHI Jhingran. APH: New Delhi. In MacKenzie, P. (2009). Mother tongue first multilingual education among the tribal communities in India. *International Journal of Bilingual Education and Bilingualism*, 12 (4), 369-385. doi: 10.1080/13670050902935797.

Kembo, J. (2000). Language in education and language learning in Africa. In Ejieh, M. U. (2004). Attitudes of student teachers towards teaching in mother tongue in Nigerian primary schools: implications for planning. *Language, Culture and Curriculum*, 17 (1), 73-81.

Lawton, D. (1973). Language, social class and the curriculum. In Ejieh, M. U. (2004). Attitudes of Student Teachers Towards Teaching in Mother Tongue in Nigerian Primary Schools: Implications for Planning. *Language, Culture and Curriculum*, 17 (1), 73-81. doi: 10.1080/07908310408666683.

Lee, H., & Jung, W. (2004). Limited-English proficient (LEP) and mathematical understanding. *Mathematics Teaching in the Middle School*, 9 (5), 269-272.

Lee, J., Lee, J.A, & Amaro-Jiménez, C. (2011). Teaching English language learners (ELLs) mathematics in early childhood. *Childhood Education*, 87 (4) , 253-260. doi: 10.1080/00094056.2011.10523187.

MacKenzie, P. (2009). Mother tongue first multilingual education among the tribal communities in India. *International Journal of Bilingual Education and Bilingualism*, 12 (4), 369-385. doi: 10.1080/13670050902935797.

Moschkovich, J. (2002). A situated and sociocultural perspective on bilingual mathematics learners. *Mathematical Thinking and Learning*, 4 (2-3), 189-212.

Ndhlovu, F. (2010). Belonging and attitudes towards ethnic languages. *Australian Journal of Linguistics*, 30 (3), 299-321.

Ngunga, A. (2011). Monolingual education in a multilingual setting: The case of Mozambique. *Journal of Multicultural Discourses,*, 6 (2) , 177-196. doi:10.1080/17447143.2011.577537.

Orwenjo, D. O. (2012). Multilingual education in Kenya: debunking the myths. *International Journal of Multilingualism*, 9 (3), 294-317. doi:10.1080/14790718.2012.657641.

Robertson, K. (2009). Math instruction for English language learners. In Lee, J., Lee, J.A, & Amaro-Jiménez, C. (2011). Teaching English language learners (ELLs) mathematics in early childhood. *Childhood Education*, 87 (4) , 253-260. doi: 10.1080/00094056.2011.10523187.

Rollnick M. (2000). Current issues and perspectives on second language learning of science. *Studies in Science Education*, 35, 93-121.

Ronda, R. A. (2012, June 3). *DepEd to adopt new system to assess students' level of proficiency.* Retrieved July 24, 2018, from Philstar: https://www.philstar.com/headlines/2012/06/03/813152/deped-adopt-new-system-assess-students-level-proficiency

Secada, W. G. (1992). Race, ethnicity, social class, language, and achievement in mathematics. In D. A. Grouws (Ed.), Handbook of research on mathematics teaching and learning (pp. 623–660). New York: McMillan.

Setati, M. (2008). Access to mathematics versus access to the language of power:the struggle in multilingual mathematics classrooms. *South African Journal of Education*, 28, 103-116.

Skutnabb-Tangas, T., & Toukomaa, P. (1976). Teaching migrant children's mother tongue and learning the language of the host country in the context of the sociocultural situation of the migrant family. In UNESCO. (2011). Enhancing learning of children from diverse language backgrounds: mother tongue-based bilingual or multilingual education in the early years. Paris: UNESCO France.

Tabari, F., & Sadighi, F. (2014). Bilingual education : from theory to practice. *Modern Journal of Language Teaching Methods*, 4 (2) . 310-322.

Thomas, W. P., & Collier, V. P. (1997). A national study of school effectiveness for language minority students long-term academic achievement. George Mason University, CREDE (Center for Research on Education, Diversity & Excellence)Retrieved November 22, 2010,from http://www.usc.edu/dept/ education/CMMR/CollierThomasComplete.pdf.

Thompson, C. (2007). Research study designs: non-experimental. *Air Medical Journal*, 26 (1), 18-22. doi:10.1016/j.amj.2006.10.003.

Trudell, B., & Shroeder, L. (2007). Reading methodologies for African languages: Avoiding linguistic and pedagogical imperialism. *Language, Culture and Curriculum*, 20(3), 132-143.

Tupas, R. (2015). Inequalities of multilingualism: challenges to mother tongue-based multilingual education. *Language and Education*, 29 (2), 112-124, doi:10.1080/09500782.2014.977295.

UNESCO. (1953). *The use of the vernacular languages in education.* Paris: UNESCO: Monographs on Foundations of Education.

UNESCO. (2011). *Enhancing learning of children from diverse language backgrounds: mother tongue-based bilingual or multilingual education in the early years.* Paris: UNESCO France.

UNESCO. (2013). Education in a multilingual world. UNESCO Education Position Paper:Paris: UNESCO. http://unesdoc.unesco.org/images/0012/001297/129728e.pdf.

Williams, E. (1993). Report on reading in English in primary schools in Malawi. In Graham, B. E. (2010). Mother tongue education: necessary? Possible? Sustainable?. *Language and Education*, 24 (4), 309-321. doi:10.1080/09500781003678696.

Young, C. (2009). Mother Tongue Education in Multilingual Settings : Quality Education for All. *Proceedings,8th International Conference on Language and Development, Bangladesh*.

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