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ROLES AND IMPLICATIONS OF ILOKANO IN THE LANGUAGE OF MATHEMATICS LEARNERS IN THE INTERMEDIATE GRADES

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ABSTRACT

The aim of this study was to find out what role Ilokano plays and its implications in the language of mathematics learners in the intermediate grades. It also wanted to argue that a learner's first language helps them learn a subject, in this case mathematics, that is taught in another language, in this particular study, English, as required by the Philippine Department of Education. Through interviews and thematic analysis of synchronous classes in intermediate grade, this study was able to identify the following roles of Ilokano in the language of mathematics learners in the intermediate grades: (1) establishes a teacher-learner relationship; (2) offers context; (3) clarifies meaning and organizes thoughts; and (4) sets a democratic learning environment. Furthermore, the study found that Ilokano activates intermediate grade learners' critical thinking and problem-solving skills when used in their mathematics classes.

KEYWORDS: language, mathematics, intermediate grades, Ilokano, K to 12 curriculum

INTRODUCTION

The K-12 Mathematics Curriculum Framework highlights critical thinking and problem solving as important objectives, and the five connected parts are content, skills and processes, values and attitudes, mathematical tools, and context. According to the DepEd Curriculum Guide (2013), the notion of critical thinking is adopted from Scriven and Paul (1987). They defined critical thinking as the "intellectually disciplined process of actively and skillfully conceptualizing, applying, analyzing, synthesizing, and/or evaluating information gathered from or generated by observation, experience, reflection, reasoning, or communication as a guide to belief and action." In the meantime, problem solving is described by Polya (1962) as creating ways to overcome early hurdles in order to address problems for which a viable solution is not yet recognized. According to the DepEd curriculum guide (2013), these two objectives are "to be realized with a structured and

rigorous curriculum material, a well-defined set of high-level skills and procedures, acceptable values and attitudes, and suitable instruments, taking into account the diversity of Filipino learners." This framework is a crucial component of the K–12 reform process because it lays the platform for curriculum modification. Without it, it is probable that the rewriting process will be incoherent, mediocre, and unclear. Nevertheless, there is more work to be done since the majority of mathematics lectures emphasize rules and procedures rather than ideas, contexts, and real-world linkages (van den Berg, Locaylocay, & Gallos, 2007).

On the other hand, according to Vukovic and Lesaux (2013), language influences how pupils comprehend mathematical concepts. This study revealed that regardless of language, human communication, acquired information, and acquired abilities are crucial for mathematical growth. These findings show that learners need more comprehensive and targeted opportunities to build a foundational understanding of mathematical principles and ideas. Zhu, et. al. (2015) argued that linguistic proficiency is a crucial part of educational success; also, mathematics competency is essential for educational accomplishments.

DelliCarpini and Alonso (2014) stated that material cannot be taught in mathematics if learners cannot comprehend the English language. According to Bunch (2013), the academic standards of 21st century classrooms lay more linguistic demands on educators. Valle, et. al. (2013) observed that, taking into account the language background of the learners, mathematics teachers should include instructional approaches to create an atmosphere that is suitable to the learners' learning styles.

In the Philippines, intermediate grades are the years from Grade 4 to Grade 6. Particularly at this stage, the Curriculum Guide for Mathematics states that by the end of this stage, learners will be able to demonstrate understanding and appreciation of key concepts and skills involving numbers and number sense (whole numbers, number theory, fractions, decimals, ratio and proportion, percent, and integers); measurement (time, speed, perimeter, circumference, and area of plane figures; volume and surface area of solid/space figures, temperature and meter readings); and geometry (perimeter, area, volume, and surface area of solid objects).

Borlongan (2009) asserts that the delay in the use of English was intended to allow young learners, especially those from non-English-speaking backgrounds, time to acclimate to the problems of learning material in English. In actuality, however, there is antagonism to linguistic adaptability. Teachers have been reprimanded and learners penalized for using Filipino or the vernacular in mathematics lessons. In addition, in compliance with Republic Act 10533, which stipulates that Filipino and English shall be the languages of instruction by the fourth grade, mathematics is taught in English in the intermediate grades.

With all these arguments, the researcher aimed to explore the roles and implications of Ilokano in the language of mathematics learners in the intermediate grades. Ultimately, this research aspired to argue that learners' first language assist in learning a subject, mathematics in particular to this paper, which is mediated by another language.

LITERATURE REVIEW

Numerous studies on how the linguistic structure of an issue may facilitate or impede the resolution of the problem by learners demonstrate the amazing link between language and verbal problem solving (Bermejo et al., 2002). It is also important to note the cognitive benefits of bilingual children over monolingual youngsters. Bialystok (2009) demonstrated that bilingual children between the ages of 4 and 8 have a significant advantage over monolingual children when it comes to problem-solving because they are able to control their attention; they are not distracted by more confusing and deceptive aspects; and they are able to discern the apparent reality better, demonstrating a higher cognitive function. Bialystok (2018) demonstrates that multilingual experience influences the major executive component of Baddeley's (1986) Working Memory (WM) model, even in young infants. But Volmer et al. (2018) think that some skills are at least largely shaped by the language in which they were learned and developed. But this doesn't mean that these skills are always good.

Nonetheless, when we discuss the development of mathematical thinking in the early years, we are referring to a large number of constructions of fundamental concepts as well as the acquisition of mathematical procedures that allow us to develop problem solving, which is

one of the most difficult tasks (NCTM, 2000). Mathematical tasks such as counting, arithmetic, measurement approximation, magnitude comparison, and problem solving are among those that the child learns and develops throughout his childhood.Prior to processing, some writers (McCloskey, 1992; McCloskey and Macaruso, 1995) assert that each number we observe is recoded in an "amodal representation." This argument would exclude the possibility that some of the established notions have a direct link with language. However, Dehaene (1992) and Dehaene and Cohen (1995) provide three sorts of internal representations that may be used to solve problems: an analog magnitude, an Arabic visual code, and a verbal system. This leads them to think that there are strong connections between how math is thought of in the mind and how it is talked about.

First, the kid learns a concrete or perceptual arithmetic that subsequently becomes abstract via the use of spoken language, and then he creates writing based on the representation of numbers using digits. This transition from perceptual to abstract arithmetic is not yet scientifically characterized, although it is hypothesized that distinct areas of the brain are activated. How this shift from concrete-perceptual to abstract-symbolic arithmetic is accomplished and subsequently concretized by digits is currently unknown, though several neuroimaging studies demonstrate the importance of working memory in difficult arithmetic tasks and demonstrate how working memory employs visual or verbal methods based on an individual's cognitive strategies (Delazer et al., 2003).

Colomé et al. (2010) performed research with Italian monolinguals and Basque-Spanish bilinguals about calculus operations. These authors departed from the hypothesis that Basque-Spanish bilingual participants would have an advantage over Italians because the linguistic structure of the numbers, centered on the base 10 and 20, corresponded with that of their dominant language, if language influenced calculation even when numbers were presented in Arabic. According to the findings of this research, language usage has a variety of benefits. The authors write: "It seems that the word used to name a number affects how it is processed."

We should also analyze how teaching in a second language is done. Some studies indicate that direct instruction and educating instructors via programs based on visualization and led by the choices they may make during such instruction can enhance early childhood education and, therefore, the performance of their pupils. Studies, such as those conducted by Kraft and Hill (2018), demonstrate how teacher training enables teachers to recognize and implement crucial aspects of mathematics quality teaching in their daily lives; this substantially improves the quality of their classes and the performance of their learners.

METHODOLOGY

This study was conducted at MMSU Laboratory Elementary School. The school is under the direct supervision of the College of Teacher Education. It serves as the venue for experiential learning courses and internship experience for teacher education students from the Bachelor of Elementary Education Program, Bachelor of Early Childhood Education Program, and Bachelor of Special Needs Education Program. The school is situated at Brgy. 5, A. Castro Avenue, Laoag City, Ilocos Norte. The dominant language used in the community where the school is located is Ilokano. Data revealed from Form 1 revealed that of the schools' population, 60.6% of learners have Ilokano as a mother tongue; Tagalog with 11.7%; and English with 27%. In a study conducted in 2020, the learners were described as mostly understanding Ilokano. However, this does not imply that they are fluent in the language and always use it. The researcher interviewed the intermediate mathematics grades and also analyzed the recorded synchronous intermediate grade mathematics classes in order to identify the roles and implications of Ilokano in their classes. All the procedures followed in this study are in accordance with the reviewed and approved research protocol by the University Research Ethics Review Board under the study titled Ilokano-Based Translanguaging Approach to Mother Tongue-Based Multilingual Education.

RESULTS AND DISCUSSIONS

Roles of Ilokano in Intermediate Grades Mathematics Classes

Role 1: Establishes teacher-learner relationship

The most notable involvement of the Ilokano linguistic repertoire in the language of intermediate grade mathematics classes is the teacher's use of "anakko, ubbing, addingko."

In English, the equivalent of these terms are "my child," "children, or "my younger brothers or sisters." Aside from these words, the pronouns –mi, –ko/k, –na, and –da were noted, such as in modulemi (my module), answerko (my answer), mVLEk, referring to one's mVLE or MMSU virtual learning environment account. From these notes, the role of Ilokano in intermediate grade mathematics classes' language as the establisher of the teacher-learner relationship can be seen. Swan (2002) described this as "verbal immediacy behaviors," which are an important support in online teaching and learning environments.

Role 2: Offers contexts

One of the themes that emerged in the analysis of the transcription of the online class proceedings on intermediate grade mathematics was the role of Ilokano in providing the context during the discussion. In order to make teaching relevant to the learners' experience, Ilokano provides an avenue for contextualization of the lesson. The names, objects, and events used in the examples are situated in the Ilokano experience. As a result, the answers or associations of the learners in the lesson are also in Ilokano. This means that even though English is the language, the objects they still use to communicate in the lesson are Ilokano. In this case, the value and impact of the cultural and language background of the learners can be seen even in their use of L2. It is not only important in the effort to contextualize the lessons from the end of the teachers; among learners, this can be seen as the learners' unconscious effort to ground, contextualize, or personalize lessons.

Role 3: Clarifies meaning and organizes thought

In relation to role number 2, since the use of L2 is influenced by the language and cultural background present in L1, learners' language certainly has L1-L2 complexity. However, there was a way the learners could do it. The first is to ask the teacher if they can answer in Ilokano. This aspect will be discussed in role number 4. Another is asking teachers to repeat an instruction or statement to say it in Ilokano. This strategy is beneficial to both learners and teachers. When they see that there is confusion in understanding, they often cite the explanation in Ilokano. Once the concept has been organized or the statement has been understood, at this point, the teacher bridges the instruction to English.

Role 4: Sets a democratic learning environment

It is clear to the learners that the language of instruction in intermediate grades is mathematics. Although it is clear, there are frequent instances when Ilokano occupies a space in the language of the learners—whether in writing or through speaking. Often, when the child feels that he or she can better express his or her answer or input in Ilokano, they precede it with "Can I say it or answer in Ilokano, Mabalin ti Ilokano, mam?" Aiming to engage learners in a discussion, get meaningful and critical exchanges, and have space to know the situation of the learners to provide competent feedback and scaffolding, teachers do not mind learners answering in Ilokano. This practice sets a democratic learning environment in the intermediate grades of mathematics. Jørgensen (2004) describes the effect of democratic learning environments. He said that this gives learners more control over their learning and uses shared decision-making to get more people involved and improve learning.

Implications of Ilokano in Intermediate Grades Mathematics Classes

In the analysis of transcribed proceedings during online synchronous classes, it can be seen that the language of intermediate-grade mathematics learners can be described as translanguaging. Although English is the clear language of instruction, there are linguistic features of Ilokano—and sometimes even Tagalog—that are involved in the use of language by learners. Based on the previous discussion of the roles of Ilokano, it can be said that there are advantages and disadvantages to this way of using the language. However, there is a disadvantage, the teacher has a way to use it in advantageous ways, such as bridging or scaffolding.

Contrary to the frequent comments of some that it is difficult to teach mathematics in the Ilokano language, Ilokano spontaneously enters and affects the learning of mathematics. In cases where the statements are difficult or complicated, Ilokano or Ilokanizing the explanations most of the time clarifies. This means L1 has the ability to activate learners' critical thinking and problem-solving skills.

Based on the analysis of the proceedings of online synchronous classes in intermediate grade mathematics, the language and cultural background of the learners are also

voluntarily and unconsciously used by the learners to ground, claim, and personalize the learning of mathematics. In this effort, the interrelated aspects of mathematics education content, skills and processes, values and attitudes, and tools stated in the DepEd curriculum guide for mathematics have equivalent Ilokano concepts.

Lastly, the free entry of Ilokanos into intermediate grade mathematics classes that would have been expected to be taught in English, sets a democratic learning environment. It secures an honest exchange of ideas and has many implications for teachers on how well learners are learning. That will not happen if expressions are limited only to English.

CONCLUSION

This study identified Ilokano mathematics learners in the intermediate grades as translinguals. In their practice of multilingualism, its disadvantages and advantages have been identified. In addition, teachers' strategies for using translanguaging towards intensifying mathematics teaching were also identified. In this regard, translanguaging can be said to be effective. In this way, a Framework for Translanguaging Pedagogy in Mathematics is needed to make its use even better.

One of the requirements of RA 10533 in relation to MTB-MLE is to have a transition or bridging after grade in preparation for intermediate grades when the main medium of instruction becomes Filipino and English. In the analysis, the major role of Ilokano—whether language, usage, or events, as examples—was seen in the contextualization of mathematics instruction. The analysis of this paper can give an idea of how to implement the transition or bridging program across subjects in a way that ensures L1 is not left behind or missing in practice.

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