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**AN ANALYSIS OF LANGUAGE ALTERNATION IN TEACHER TALK
AMONG BILINGUAL SCIENCE AND MATHEMATICS TEACHERS:
INPUTS TO THE MULTILINGUAL EDUCATION BRIDGING PLAN**

A Thesis

Presented to the

College of Graduate Studies and Teacher Education Research

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of the requirement for the Degree

MASTER OF ARTS IN EDUCATION

with specialization in Bilingual Education

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ABSTRACT

This descriptive-qualitative study aimed to describe and analyze the language/s used by bilingual science and mathematics teachers in delivering instruction and managing their online synchronous classes. Likewise, it explored their reasons for alternating languages and how such could contribute to the existing multilingual education bridging plan. One science teacher and two mathematics teachers participated in the study. It employed various means of data collection methods such as participant observation, content analysis, stimulated recall, and semi-structured interviews. Data were analyzed using the Analysis of Speech units and teacher talk typology. As for the reasons for language alterations, data were analyzed thematically. Results revealed that Filipino and English were used to varying degrees; teacher talks were most instructional and were used to give explanations, acknowledgments, and reminders while management talks were used to chat with students, ask them to do something, encourage them, and give turns and instructions. Reasons for such alterations included consideration for learners, improvement of content, development of instructions, and facilitation of interaction. Thus, specific use of L1 and L2 as language of learning and instructions served as inputs to the existing multilingual education bridging plan. In terms of L1, teachers can use it for reinforcement, explanation of local concepts, and valuing. In terms of L2, teachers can use it in the initial presentation of new lessons and explanations of previous lessons, practicing class routines, and concluding lessons. Nevertheless, it is recommended that similar studies be done in other contexts and that the suggested inputs to the bridging plan be validated on learners.

Keywords: bilingual, teacher talk, language alternation, synchronous class

CHAPTER 1

THE PROBLEM AND LITERATURE REVIEW

This chapter presents the background of the study, the review of relevant literature and studies concerning the topic, the theoretical and conceptual framework, the research paradigm, the scope and limitations, and the definition of terms.

1.1 Background of the Study

The former bilingual education policy of the Philippines recognized the use of only two languages as media of instruction: Filipino and English. The former was used in the teaching of Filipino, History, and Social Studies, while the latter was for the rest of the other academic disciplines such as English, Mathematics, and Science. However, in a country where more than a hundred languages are spoken, such a policy puts the speakers of vernacular and minority languages at a disadvantage. Also, it consequently endangered the country's rich and varied linguistic heritage and diversity.

The current Mother Tongue-Based Multilingual Education (MTB-MLE), a feature of the Philippines' Department of Education's K-12 curriculum, recognizes the significant role of first language literacy not only in second language learning but even in content subject learning. This is shown in the pioneering longitudinal study of Walter and Dekker (2011) which illustrated that the practice of teaching young learners in their mother tongue had resulted in better academic performance as shown in the students' standard test results. Apart from this, a review of different mother tongue-based education programs in different parts of the world claims that such programs instigated better access to education, improved reading and learning outcomes, well facilitated second and foreign language

learning, more efficient internal education system, strengthened self-concept and identity among learners, reinforced local culture, and increased parental involvement (Pflepsen, 2013). With these, the Department of Education (DepEd) has institutionalized and mandated the use of the learner's first language, or L1, as the medium of instruction through Department Order 94. The system works by initially and exclusively developing the learner's first language literacy and then followed by L2 oracy and later literacy until such time that instruction can be done exclusively in L2. This system ensures strengthened cognitive foundations and smooth systematic transitions in the learning and acquisition of concepts and skills taught in class. More so, it ultimately seeks to address the high rate of functional illiteracy in the country.

While the former bilingual policy recognized only Filipino and English as primary languages of instruction, the MTB-MLE policy goes back to the use of the learner's native language. At present, DepEd recognizes eighteen local languages in the implementation of MTB-MLE, namely: Aklanon, Bikol, Cebuano, Chabacano, Hiligaynon, Iloko, Ivatan, Kapampangan, Kinaray-a, Maguindanaon, Maranao, Pangasinan, Sambal, Surigaonon, Tagalog, Tausug, Waray, and Yakan. These are the languages of instruction in the early grades of formal schooling. After the third grade, the learners are to be taught in Filipino and English with the vernacular languages serving as auxiliary languages.

Assuming that the system has worked well, the students ideally should have enough competence to understand instructions delivered in the second language or L2 (English), participate during class activities, and accomplish tasks involving the use of second (L2) by the time they reach high school. However, a review of various studies regarding the medium of instruction used in Philippine classrooms, both in the secondary and tertiary

levels, reveal that both teachers and students alike favor the use of L1 in the form of English-Tagalog code-switching during class lectures, discussions, and activities. Some studies claim that such results to a higher level of comprehension, interaction, and efficient classroom management.

The current MTB-MLE acknowledges the potential of the L1 in developing literacy, languages, and content knowledge. Moreover, there have been a lot of studies concerning the use of first language, both exclusive use or through code-switching/mixing, in classrooms, but most focused on its use among students. However, the present study explored its use among teachers during teacher talk or their use of language in the classroom. It was deemed worth investigating since teacher talk is considered as a rich source of comprehensible language input for students which is the founding aspect of language acquisition and learning.

While most studies conducted about the language/s used in teacher talk were conducted in the context of language learning in face-to-face instruction, the present study intended to fill in the gap by investigating the language/s used in teacher talk in online synchronous science and mathematics classes. It attempted to find out the extent of language/s used, type of teacher talks, and context of its usage. This sought to provide implications on content area pedagogy and the existing educational practices.

1.2 Literature Review

1.2.1 The Current State of Filipino Students' Language Proficiency

In the most recent English Proficiency Index study, the Philippines has fallen from the 14th place in 2018 to the 20th place in 2019. Details of the study revealed that 60 out of 100 Filipinos were considered highly proficient in English. This considered the country as

second among 25 countries in Asia in terms of English proficiency (Valderama, 2019).

In a study by Navarro et al. (2015) among 486 college students taking a maritime course, they found out that the students rated “incompetent” in terms of vocabulary knowledge and reading comprehension, and “fairly incompetent” in terms of grammar. In another study by Dela Cerna (2019) concerning criminology students, 49.08% of the 163 student-respondents rated “poor” in English proficiency, while only 1.23% of them rated as having “good English proficiency.” In terms of critical thinking skills that are very much related to language, it was found out that 49.08% of the students were poor at inferences; 49.7% were poor at analyzing arguments, and 46% of the students rated only “fair at interpreting information.” The results of the aforementioned study are bothersome, especially that the study of Patron (2016) involving 862 college students from different programs claims that English proficiency is significantly correlated with college students’ academic performance.

As to the possible reasons behind these unfavorable findings toward the use of English among Filipino learners, the study of Quinto and Macayan (2019) investigated the possible correlation between speaking anxiety and speaking performance. The study employed a mix-method approach. In the quantitative part of the study, findings show that there is an inverse relationship between speaking anxiety and speaking performance. This means that the students who have high speaking anxiety level score lower on speaking performance tasks and vice versa. As to the reason for such anxiety, the qualitative part of the study suggests that social comparison in speaking tasks is a common contributor to anxious feelings among the participants of the study. That is, the respondents were worried that they would be judged and ridiculed by both their classmates and the professors themselves.

Not only students but also teachers themselves were part of the alarming figures of declining English proficiency in the country. In the study conducted by Meniado (2019), he surveyed 41 full-time faculty members of a multidisciplinary higher education institution. He used the scores of the faculty members in a valid English proficiency test then converted them to the Common European Framework of Reference standards. The results of the study revealed that more than half of the faculty members were considered intermediate, whereas one-third were considered upper-intermediate. Individuals on an upper intermediate level of proficiency were described as those who can understand main ideas of complex text on both concrete and abstract topics in specialized fields. They can also interact with a certain degree of fluency and spontaneity and without strain. Lastly, they can produce clear and detailed text on a wide range of subjects and give viewpoints about them. On the other hand, intermediate users were described as being able to understand main ideas and make clear and detailed input on familiar topics of interest. They can also adapt to an environment where English is widely spoken. Lastly, they can produce connected text on a wide range of familiar topics of interest. In terms of individual macro skills, results show that in terms of listening and reading, the faculty members were on the upper intermediate level; while in terms of listening and speaking, the faculty members were on the intermediate level only.

In terms of Filipino language proficiency, the 2018 National Achievement Test Results show that Grade 10 learners scored high in Filipino across three skills, namely: problem solving, information literacy, and critical thinking with scores 58.27, 67.74, and 59.88 respectively. This is significantly higher as compared to their scores in the aforementioned skills in English (50.93, 40.32, and 37.77 respectively). Moreover, a study

of De Leon (2019) investigated the competence of Filipino learners in their macro-skills in Filipino. Results show that Filipino learners are more competent in writing (71%) and reading (53%) than listening (44%) and speaking (31%). In terms of language structure, the study of Misa (2021) among Grade 9 students found that young Filipino learners rated “beginning” in terms of word choice, sentence structure, and logical organization and rated “developing” in word use, sentence order, and sentence construction, and mechanics. Moreover, Tana (2021), identified the factors that influence Filipino students’ proficiency in the Filipino language, namely: the peer group, mother tongue, teachers, and mass media. Among these factors, the study claims that it is the teachers that have the highest influence.

1.2.2 The Language in Bilingual/Multilingual Classrooms

Despite efforts of teachers, educators, and policymakers in institutionalizing the maximum use of the target language classrooms, it seems that the use of L1 is inevitable and indispensable in the teaching-learning process of bilingual or multilingual classrooms, be it in second/foreign language classes or/ and content area subjects. This is shown in the study of Rosalina (2021) that English as a Foreign Language teachers in Indonesia use their native language in the different contexts of both instructional talks (i.e., giving explanations, asking questions, and answering questions) and management talks (i.e., giving instructions, giving reprimands, giving advice, and giving announcements).

The study of Alrabah et al. (2016) regarding the use of L1 in college classrooms in Kuwait reveals that apart from its more cognitive-facilitating use in the teaching of vocabulary and grammar, efficient use in test administration, and maintenance of class order, the learners’ first language is used also to create a non-threatening and non-intimidating environment, establish identification with the linguistic group, and maintain

a more productive classroom environment.

A two-year large-scale study conducted by Brevik and Rindal (2020) in public schools in Norway aimed to determine what language or languages were used in the classroom and how students perceived it. Findings show that the variation in language use depended on the teacher more than the students. Also, the study shows that students perceive the use of Norwegian helpful.

Similarly, a study conducted by Li (2018) investigated the teachers' use of the students' L1 during classroom interaction using the Initiation-Response-Feedback cycle (IRF). The study found out that teachers used the students' first language in order to encourage participation, prompt students to correct themselves, and give instructions efficiently. However, since it was against the policy or at least what the teachers thought should be happening inside a second language classroom, it also caused guilt on the part of the teachers since they believe it decreases the students' exposure to the target language. Probably to balance out the use of the native and the target language, some teachers used code-switching as part of their classroom strategy.

Code-switching is a speech style unique to bilinguals that is a result of the universal language contact phenomenon, in which fluent speakers switch languages between and within sentences within one conversational episode. In terms of structure, Abeywickrama (2007, as cited by Liwanag & Labor, 2016) claims that the main language used in code-switching is the speaker's mother tongue while the other language appears as word insertion.

As to its use, Baker (2006) says that code-switching serves many purposes in a multilingual setup. These purposes include emphasizing a particular point, substituting an

unknown word in the target language, expressing a foreign concept, reinforcing a request, clarifying a point, expressing identity, communicating friendship, easing tension, and injecting humor into a conversation. Cook (2001) states that code-switching in the classroom is a natural response to a bilingual situation. The switching from one language to another is a highly desirable ability among learners.

The use of code-switching in the classroom used to be frowned upon. Some experts like Gumperz (1982 as cited in Liwanag & Labor, 2016) claim that code-switching functions as the speaker's strategy to compensate for incompetence to use L2, or interference of L1 when using the L2. Also, Bautista (2004, as cited in Tupas & Martin, 2016) considers the use of Taglish (Tagalog-English code-switching) as a form of corruption of both languages and its use as a medium of communication is a manifestation of the speaker's lack of knowledge in either of them. However, it has found its place in bilingual and multilingual education. A lot of studies have been conducted to prove its favorable use both in language learning and content areas.

The study of Garcines and Alvarez (2017) investigated the advantages and disadvantages of code-switching in the classroom. In the qualitative section of the study, they explored the perspectives of teachers on their use of code-switching in class. Findings showed that teachers use code-switching from L1 to L2 for the student to understand the lesson. They said that it is an efficient means to make the students understand the lesson or to put emphasis on the important parts of the lesson. Also, it is used as a strategy to increase class interaction and participation and to inject humor during lectures and discussion. However, while some of them do not use or even encourage students to code-switch, a majority of them employ it a lot in class; and they believe it causes the very

deterioration of their communication skills in English. In an earlier study conducted by de la Campa and Nassaji (2009), they explored the functions of teachers' use of L1 in a foreign language class (German). The findings of the study revealed that teachers used L1 for fourteen different reasons. However, the most common were for translating, giving instruction, and making personal comments.

As to how often or frequently teachers code switch, the study of Yap et al. (2017) suggests that it may be determined by the level of English proficiency of the students. In their survey among 497 college students, they found out that students who perceive themselves as having "good" English proficiency skills perceive their teachers to be "sometimes" code-switching, as compared to those who perceive themselves as having "satisfactory" level of English proficiency who perceive their teachers to be "always" code-switching. This finding suggests that the students' level of L2 proficiency determines whether the teachers will use code-switching.

In terms of the reason as to why teachers use code-switching in the classroom, Khonakdar and Abdolmanafi-Rokni (2015) surveyed 60 Iranian EFL teachers to explore their reasons for using code-switching in their classes. Results reveal that the most common reasons are to make clarifications, to give effective instructions, and to provide a smooth topic transition. Similarly, de la Campa and Nassaji (2009) also investigated the foreign language teachers' reasons for using L1 in a German language class. The findings revealed that the class context, the students' low proficiency level, the class setup, students' objectives, classroom acoustics, and the speed of discourse were some of their reasons for using L1 in the classroom.

In terms of teacher beliefs in the use of L1 in a multilingual classroom, the study of

Tan (2017) explored the beliefs of teachers teaching English for speaking of other languages (ESOL) courses to international students who all came from different foreign countries. The programs served as their transition to bridging English for academic purposes (EAP). In an interview with the teachers, the findings of the study showed that even though they believe that too much use of L1 impedes English progress, they find it impossible to remove the use of L1 from the classroom as a student's L1 serves as part of their identities. Also, the use of L1 is a form of affective and cognitive coping mechanism. What the teachers believe is not a total eradication of L1 use, but only a limited and monitored use of L1 in the classroom to optimize L2 learning.

In a quantitative study on teacher beliefs about the use of L1, Erk (2017) investigated the teachers' perceived role of L1 in the development and formal teaching of English in different educational contexts in Croatia. In terms of its frequency of use, the results showed that more than half of the teachers (53%) "sometimes" use L1 in teaching English. In terms of educational stages, both primary teachers and secondary teachers reported that they "sometimes" use L1 in English instruction. However, tertiary teachers both "rarely" and "sometimes" use L1 in their English classes. These findings seem to suggest that use of L1 in English classes is more prevalent in lower educational years. In terms of the perceived benefits, the teacher respondents reported that the use of L1 benefits learners in terms of confidence and comfort, better understanding of vocabulary, efficient teaching, better understanding of grammar, and generally learning English better. However, it is also surprising that they did not agree that using L1 contributes to efficient time management and better retention of vocabulary.

However, a more elaborate small-scale study on the potentials of code-switching

conducted by Domingo (2015) investigated the language preferences of Filipino students and its effectiveness as a medium of instruction in a mathematics class. In the descriptive part of the study, the students' self-perceived evaluation of their communication skills both in English and Filipino was assessed. Findings show that the majority of the students considered themselves excellent in listening, speaking, and reading in Filipino. However, when it comes to writing, most considered themselves to be just above-average. In terms of their communication skills in English, a large fraction of the students considered themselves as having above-average levels in all four areas. But despite this, the students reported preferring to receive instruction in mathematics with the teacher using English-Filipino code-switching as a medium of instruction. As for the experimental part of the study, the students were divided into groups. Group A received instruction in English, while Group B received instruction in both Filipino and English. The students were post-assessed for their level of understanding of the lesson, the difficulties they encountered, their preferred medium of instruction after the intervention, and their reasons for their preferred medium of instruction. Findings show that a large fraction of the students from both Group A (63.33 %) and Group B (75%) stated that they understood the lesson well, while only 18.75% from Group A and 25% from Group B reported that they only had a moderate understanding of the lesson. Also, a large fraction of the students from Group A (84.38%) and Group B (85%) reported that they did not have any difficulty in understanding the lesson. As for the preferred medium of instruction, the majority of the students from Group A (87.5%) and Group B (90%) still preferred the use of code-switching in receiving instruction. However, it is worth noting that there was an increase in preference for the use of code-switching. The results of the study suggest that regardless

of the English proficiency of the students, they still prefer the use of code-switching in the delivery of the lesson and during class discussions.

However, this preference for code-switching is not only limited to the teaching of content subjects such as mathematics; even in ESL classes students seem to favor the use of code-switching even when most school policies encourage both students and teachers to use the target language and avoid the use of other languages during English classes. For the quantitative part of the study of Garcines and Alvarez (2017), a great majority of the students (73%) reported that they used code-switching in their previous schools. The findings of the study revealed that students preferred the use of code-switching in their English classes. They believe that such practice does not weaken their L1 or L2, does not diminish the image of the teacher, but it even increases their chance of passing exams.

A study conducted by Catabay (2016) investigated students' perception of code-switching used in an ESL class. Results also show students hold a positive view of the use of code-switching as a medium of instruction even in an ESL class. Likewise, students reported that the use of code-switching does not negatively impact both their first and second language. It rather helps the maintenance of both. Also, the students reported that the use of code-switching gives them a positive emotional state and even helps them learn better.

A study of Dela Rosa (2016) looked at the factors as to why students use code-switching in the classroom. The findings of the study reveal that the major reason why students use code-switching is their lack of English vocabulary. However, other reasons such as to ease communication, to avoid misunderstanding, to share information, and to put emphasis were also mentioned.

Khaerunnisa (2016) conducted a case study involving an EFL teacher in Indonesia who uses code-switching in class using three languages (i.e. English, Bahasa Indonesia, and Javanese). Findings reveal that the teacher uses inter-sentential code switching, intra-sentential code switching, and tag switching. As to the reason, the teacher reported that code-switching in class helps her in providing clear explanations of concepts, explaining the meaning of vocabulary words, clarifying pronunciation, clarifying task instructions, and facilitating classroom discipline.

In terms of the grammar pattern of English-Tagalog code-switching, Catabay (2016) conducted a qualitative study of Filipino students' English-Tagalog code-switching patterns in which she analyzed the tape-recorded group discussion of the students who were participating in a small group discussion activity. She found out that students' utterances were dominated by English rather than Tagalog. Because of observation, she suggests the term *Engalog* instead of *Taglish*.

However, this is in contrast with the findings of Liwanag and Labor (2016). In their analysis of 279 words and phrases of 81 students, they found out that the utterances prioritize Tagalog as the main language with just insertion of English function and content words. Also, their study reveals that Tagalog code-switches generate more illocutions as compared to English. English-Tagalog code-switching occurs mostly in assertive, followed by expressive, and directive speech acts. This, according to their analysis, suggests that students can elaborate their ideas through code-switching rather than using only one language. Also, code-switching seems to create a more casual and friendly classroom environment encouraging participation.

However, apart from code-switching, there is also code-mixing. Humaera et al. (2019)

explored the switch and mix of languages in a multilingual class. Their findings show that a) students code-switch languages in the form of question tags, “intersentential switchings,” and “intrasentential switchings,” On the other hand, students code-mix “extrasententially.”

1.2.3 The Functions of Teacher Talk

Teacher talk is the teacher’s use of language in the teaching and learning process. Therefore, teachers are expected not only to have good communication skills, but also to be capable of adjusting their language to the comprehension level of the learners and to regulate the amount of time they engage in talking for their classes to be interactive and genuinely student-centered. In an education system where second language learning is prioritized by integrating language learning and content learning, teacher talk becomes a good source of comprehensible input which is the foundation of successful language learning and acquisition. In turn, teachers become models of the learner’s target language. The study of Inceçay (2010) explored the role of teacher talk in the language learning process among young learners. The findings of the study came up with seven functions of teacher talk, divided into two categories, namely: construction and obstruction. Construction increases the learning potential. Teacher talk functions facilitate this process through direct error correction, content feedback prompting, extended wait time, and repairing. On the other hand, obstruction is a process that reduces learning potential and hinders learner involvement through turn completion, teacher echo, and extending the use of IRF turn taking.

There are different models in analyzing and categorizing teacher talk in classrooms. One model is that of Doff (2000) in which he categorizes teacher talk into two types,

namely: instructional and management talk. Instructional talk is employed by the teacher to present a lesson, while management talk is used in managing classroom activities. These two categories are further subdivided into different contexts of use (see Muhayyang, 2010). Sahlim (2017) observed the classes of nine English teachers in an Indonesian university and identified nine functions of teacher talk, namely: introducing the lesson, correcting, repeating, defining, giving examples, clarifying, questioning, and encouraging. These are the most frequently used functions of teacher talk which facilitates learner comprehension of the teacher inputs.

The study of Domalewska (2017) investigated teacher talk discourse in a content and language integrated learning classroom in a Thai university. She used the 90-minute lecture of a bilingual Thai-English lecturer. Afterward, she analyzed the lecturer's talk according to the predetermined categories suggested by Baker (2011) regarding the functions of code-switching, namely: emphasizing concepts, substituting, reinforcing a request, clarifying a message, expressing identity and friendship, easing tension, injecting humor, and introducing an off-topic comment. The results of the study showed that substituting, emphasizing, and clarifying were the most common functions of code-switching in teacher talk. These were done in order to clear confusion, improve comprehension, facilitate retention, and emphasize technical terms and concepts related to the lecture content.

Nasir et al. (2019) investigated teacher talk in an EFL classroom using Flander's (1970) framework called Flanders Interaction Analysis Category System or FIACS. This framework classifies teacher talk into two categories according to its influence on the students. These are direct and indirect influences. Furthermore, these two categories are

further subdivided. As for the direct influence, there are three more categories (i.e. lecture, giving directions, and criticizing or justifying authority.) On the other hand, the indirect influence category is further subdivided into four categories (i.e. accepting feelings, encouraging, accepting ideas, and asking questions). The researchers observed three 90-minute meetings of an English senior high school teacher. Findings reveal that the seven functions were present in the talks. However, the most frequently used were giving directions (36.3%), asking questions (28.7%), and praising or giving encouragement (14%). These were mostly done to inform the class what they were going to learn and sustain the students' attention by checking their understanding of the topic. In the interview part of the study, the teacher-participant claimed that she made the most of teacher talk in order to make the students active.

Zulfah et al. (2015) investigated the extent of use of instructional and management talks as well as the extent of the use of first language and second language in these talks in EFL classrooms. Their findings show that the teachers spent most of the time in management talks (65%) than in instructional talks (35%). In terms of the subcategories of management talks, teachers' utterances were mostly for giving instructions (29%), giving directions (11%), and asking questions (10%). On the other hand, in terms of instructional talks, teachers' utterances were mostly for asking questions (15%). As for the language used in management talk, the native language was used for giving punishments (100%). However, the target language was used for giving advice (1%), reprimanding (1%), and asking questions (1%). In terms of instructional talks, the target language was used for greetings (100%), giving thanks (100%), and closing activities. But then, that target language was rarely used in answering questions.

A study by Fesaway-Malao et al. (2015) compared the amount of teacher talk in three subject areas, namely: English, science, and history. They observed four classes in each subject area. Findings reveal that teachers in English classes spent a moderate amount of time talking, with an average time of 15.33 minutes or 45.30%, while science and history teachers spent 18.58 minutes or 52.48% and 43.50 minutes or 62.96 % respectively.

In the action study conducted by Meng and Wang (2011), they surveyed 104 freshman students enrolled in an English class to set out guidelines for teachers regarding teacher talk in the classroom. The results of their study show that in terms of questioning, students preferred to be called at random with not more than ten seconds to think and prepare. Also, they preferred referential questions over display questions. In terms of the treatment of their errors, students preferred teachers to correct them discreetly and to treat errors as opportunities for learning. Also, they would like teachers to provide clues in case they are having difficulty answering questions. In terms of teaching methods, they preferred teachers who give them opportunities to express themselves and inspire their interests. They also preferred an active, student-centered classroom atmosphere.

The study of Liwanag and Labor (2016) reveals that among the illocutionary acts performed in the classroom, it is assertive acts that seem to be more prevalent. However, in the case study of Basra and Thoyyibah (2017) on analyzing the speech acts performed by the teacher in an English as a Foreign Language class in an Indonesian classroom, it was found that representative speech acts dominated much of teacher talk comprising 70% of the utterances. Further probing of the teacher-participant reveals that through asking, inviting, and permitting students to speak and talk to one another encourages them to engage in a meaningful communication, which she believes as the best way to learn and

acquire a second language. However, the study of Andewi and Wazania (2019) yields different results. In their study involving an English teacher, it seems that the most frequently used speech act is directives occurring in 71.8% of the utterances; whereas representatives come second most frequently used speech act occurring in only 21.2% of the utterances. As for the study of Sumedi and Rovino (2020) regarding the speech act of English teacher talk, the analysis revealed that out of the five types of speech acts, the English teacher only performed four speech acts, namely: directive, assertive, commissive, and expressive. Of these four, it was the directive speech act that was the most frequently used. The directive speech acts were used to ask students to do a task, answer questions, and follow instructions.

Apart from Searle's Speech Act Theory, there are other means of analyzing teacher talk. One of these is the categorization developed by Sinclair and Brazil (1982). This model categorizes teacher talk in classroom interaction into two major categories, namely: initiation and follow-up. Initiation can be further categorized into three sub-types, namely: questioning, inviting, directing. In terms of follow-ups, there are two sub-categories: one is for incorrect responses, namely: informing, prompting, encouraging, criticizing, and ignoring; while in terms of correct answers, there are two: acknowledging and commenting. Arif et al. (2018) analyzed teacher talks through the aforementioned model. They analyzed the teacher talk of four English teachers handling grades seven, eight, and nine. They found out that among the types of initiation, the most common is the use of display question, which is asking an easy question such as asking for a definition of a common word or asking about a topic that has just been learned. In terms of follow-up questions, the most common type is acknowledgment, which is giving short verbal

admission of the student's contribution to the classroom activity.

While teacher talk provides a rich language input for the learners, Pratiwi (2019) expressed a couple of concerns about its use. First is the amount of teacher talk. If teachers dominate the class discussion, there will be less opportunities for the students to engage in class interaction, limiting their chances to use the target language. Another concern is the exclusive use of L2 while disregarding the use of L1. Such makes it difficult for the learners to understand complicated language concepts such as grammar.

1.2.4 STEM Education and Language Acquisition/ Learning

In the Philippines, despite the recognition of mother tongue as an auxiliary language in learning, the dominance of English is still obvious and prevalent in teaching practices. Learning materials such as textbooks and assessment materials such as standardized tests in content-areas are still in English. Therefore, it can be assumed that even though teachers make use of the students' first language to facilitate comprehension, still students are expected to produce output in English. In the review of Karami and Zamanian (2016), it was found out that there are three dominant methods used by English teachers in the Philippines. These are English for Specific Purposes, Task-based Language Teaching, and Communicative Language Teaching. However, among these three, it appears that CLT is the most widely used almost by default. This approach was first introduced to the country in the 1980s but was largely misunderstood and pedagogically unclear. It has also been criticized for appearing to have less serious learning activities, being unable to respond to the need for accuracy, unfit for large classes and inadequate funding for teacher training, and also for being burdensome to prepare as it requires authentic learning materials.

In an article by Oyoo (2015), she mentioned the importance of language in the

teaching of science. Also, she made mention of the importance of words or vocabulary in the science classroom. She differentiated two broad components of words, namely: technical and non-technical words. The former refers to words that are specific to the discipline, while the latter refers to a particular vocabulary used in the learning and teaching in the classroom or the language of scientific texts.

In 2003, the education policy in Malaysia changed the medium of instruction in teaching science and mathematics from Bahasa Malay to English. These posed some problems for the teachers. In terms of using the language as the medium of instruction, a great majority of the teachers encountered problems in using new terms correctly (92.3%), expressing themselves in English correctly (88.5%), explaining concepts in English (85.2%), using Bahasa Melayu in class (81.1%), and learning the necessary English vocabulary words (80%). In terms of the problems they encountered in the classroom, more than half of them reported that they encountered problems in providing examples in English (76.9%), responding to students in English (73.1%), preparing reports and instructional materials in English (73.1%), using different languages (70.5%), and engaging in class discussions in English (65.4%). Despite these challenges, science and mathematics teachers find language support from multimedia courseware (87.5%), English colleagues (80.7%), subject matter experts (76.2%), and the buddy system (70.4%).

The article by Hoffman and Zolman (2016) offers ways regarding what STEM teachers have to know about English language learners and what they can do to support the learners' language development. In terms of what they need to know, STEM teachers should remember that students are learning two types of English to be successful in school.

These are basic interpersonal communication skills (BICS) and cognitive-academic language proficiency (CALP). While BICS is the social language which is less cognitively demanding and often includes nonverbal cues and context, CALP is an academic language that is more cognitively demanding and often used in situations without a lot of context cues. Another one is that STEM teachers should be aware of or knowledgeable about the students' level of proficiency. This will help teachers determine the tasks and activities they will be providing the students. In terms of what STEM teachers can do to support language learning, first is they have to provide students with background knowledge for new concepts. Concepts need to have direct connections in the real world and real life. Also, teachers have to help students build their vocabulary. Vocabulary words include three types, namely: common vocabulary, scholastic vocabulary, and academic vocabulary. Also, teachers should encourage students to produce language by increasing interaction opportunities by making sure that class activities and tasks involve the use of receptive skills (e.g. listening and reading) and productive skills (e.g. speaking and writing). Lastly, teachers should use different grouping strategies for different purposes. This means that groupings should encourage not only the use of target language, but also the use of native language to clarify concepts.

1.2.5 Okhee Lee of the New Generation Science Standards (NGSS).

According to Lee, the NGSS promises to produce learners that have acquired habits and practices needed to be successful and informed. One problem that the project wishes to address is language. In the U.S. it is predicted that by 2022, the school-age population shall consist of 50% ethnic and racial minorities. At present only 11% of the racial and ethnic minority students have access to supplementary English language programs, while

11% are under-monitored. This poses concerns as language may be hindering students with potentials. Lee stated the importance of teaching and learning “discourse” or “the way we talk”, and not just vocabulary words. Such an aspect of language shapes how students think about the world. The more they become fluent in it, the better they become. She pointed out the difference between scientific discourse and scientific vocabulary. Learning scientific discourse involves practicing skills in using mathematical models, thinking abstractly, argumentation, explanation, and communication across disciplines. By practicing these skills, students who are learning English shall also have the opportunity to use academic, content-based English. Therefore, language learning will develop alongside content-area knowledge and skills.

In the study about meaning-making in a science class (Ünsal et al., 2017) investigated the meaning-making process of bilingual students. The participants of the study are bilingual students of minority languages in a science class of a monolingual teacher. The study analyzed the exchange of utterances into two: the simple one (initiation-response-evaluation) and a more extensive one (conversations).

In the study of Ybañez et al. (2016) involving 54 randomly selected pre-service teachers majoring in general science, chemistry, and physical science, they investigated the effects of English language proficiency and scientific reasoning skills in the acquisition of content knowledge in chemistry. Results show that English language proficiency does not guarantee the successful learning of the content; rather it was found that scientific reasoning skills show a positive correlation with performance in the chemistry achievement test.

1.2.6 Synchronous Online Classes and Student Learning

The COVID-19 pandemic has forced educational institutions to suspend all face-to-face classes and shift to other modes of learning such as online, full-print modules, and blended learning. This has also paved the way for educators and other experts to explore means of learning for future endeavors. Of these modes of learning, one of the most popular among current students is the use of online learning. Such learning mode assures that, to a certain extent, learners would still have interactions with teachers for successful facilitation of learning. Adedoyin and Soykan (2020) summarized the challenges and opportunities brought by this unprecedented shift to online learning. The massive shift to online learning has brought challenges to society's technology, socio-economic class, digital competence, learning intrusion, educational assessment and supervision, teachers' workload, and subject-area compatibility. As for the opportunities, the shift paved the way for research innovations, technological innovations, and socio-economic interventions.

The study of Murphy (2009) enumerated the benefits, challenges, and solutions to the problems of online synchronous communication in second-language classrooms. As to the benefits, online synchronous language learning promotes independence and student-centeredness. Also, it was found that this mode of learning increases motivation, confidence, and self-esteem. However, despite these, there are also challenges such as teacher multitasking, technical problems (e.g. poor sound quality and time lags), learning momentum (e.g. dead space), and problems with grouping and scheduling.

The study of Turley and Graham (2019) investigated the interaction, student satisfaction, and teacher time investment in two online classroom models, one that was an independent study model, whereas the other one was teacher-led. In the study, they

conducted a survey among 1,025 students enrolled in online courses. Each model consisted of two classes, a mathematics class and an English class. In total, there were four classes under investigation. In terms of student perception of course quality, both English and mathematics courses in each model received favorable evaluations except for areas calling for instructor's feedback and response. In terms of student satisfaction, results were slightly higher in English than in mathematics courses. In terms of course completion, students who opted for the independent study model completed their courses for shorter time frames; but courses using the teacher-led model had slightly higher completion rates.

Some studies also show unfavourable results for online learning, more particularly with synchronous online classes. The quasi-experimental static-group comparative study of LeShea (2013) examined the effects of asynchronous class sessions on students' academic achievement and satisfaction in an introductory computer course. Results show that synchronous classes did not increase the students' level of achievement or their test scores. Similarly, there was no significant difference between the students' level of satisfaction between traditional online classes and real-time, asynchronous classes. These results are also congruent with the findings of Berry (2017), in which she looked into the educational outcomes of high school students enrolled in synchronous and asynchronous algebra courses. Results show that students who opted the synchronous algebra courses received significantly lower end-of-course grades and standardized test scores than asynchronous students.

However, the study of Perveen (2016) evaluated both synchronous and asynchronous language learning. The study yielded the following results: that a blend of synchronous and asynchronous is the most desirable; that asynchronous mode is beneficial for working

students, and thus best offered after regular working hours; and that synchronous sessions are still important in the development of the students' spoken English.

1.2.7 Guidelines on the Language of Instruction in Philippine Schools

DepEd Order No. 16, s. 2012 lays out the guidelines on the implementation of Mother-Tongue Based Multilingual Education (MTB-MLE). MTB-MLE has two areas of focus, namely: mother tongue as a learning/subject area and as a medium of instruction. The learners' L1 shall be used as the medium of instruction in all learning areas from Kindergarten through Grade 3 with the exception of Filipino and English classes. L2 will be introduced in the first semester of Grade 1 for oral fluency while L2 literacy will be introduced in the second semester.

An earlier document, DepEd Order no. 74, s. 2009, lays out the guidelines in the use of different languages in a multilingual context through two sets of bridging plans. Bridging Plan A is for contexts where the learners' L1 is a local language that is not Filipino. Thus, making Filipino as their L2 and English as their L3. Bridging Plan B is for contexts where the learners' L1 is Filipino while their L2 is English. Bridging Plan B is to be used to scaffold learning, develop more complex and rhetorical use of L2, and discuss local concepts, places, activities, and issues/problems, and learn other local languages, which consequently be considered as their L3. L2 can be used as the language of learning and instruction for subjects such as English, science, and mathematics while the learners continually aim to develop independent literacy levels in the language. While the present policy recognizes the role of L1 in classroom instruction and procedures, the present study aims to specify which language/s are used by bilingual science and math teachers in specific contexts.

1.3 Research Problems

The present study aimed to explore how bilingual science and mathematics teachers use language in online synchronous classes. More specifically, it aimed to answer the following research problems:

1. What do the teacher-participants prefer in terms of the following:
 - 1.1 Language/s
 - 1.2 Types of teacher talk
 - 1.3 Contexts of teacher talk
 - 1.3.1 Instructional talk
 - 1.3.2 Management talk?
2. What language/s do the teacher-participants use in terms of
 - 2.1 Types of teacher talk
 - 2.2 Contexts of teacher talk
 - 2.2.1 Instructional talk
 - 2.2.2 Management talk?
3. What are the teacher-participants' reasons for alternating languages in teacher talk?
4. What can be added/suggested to the existing multilingual education implementation plan?

1.4 Theoretical Bases

The present study is anchored on two theories, namely: the goal orientation of teacher talk (Ellis, 1984) and the bilingual language modes (Grosjean, as cited in Chapelle, 2013). Goal orientation describes the teachers' intention in their utterances. It is divided into two, namely: core goal and framework goal. Core goal involves teaching of the

content relating to the curriculum while framework goal is associated with the organization and management of classroom activities. On the other hand, bilingual language modes explain how bilinguals communicate differently with monolinguals and other bilinguals. Since the study deals with bilingual teachers communicating with bilingual students with whom they share the same languages (Filipino and English), they are expected to activate both languages in communicating with them.

1.5 Conceptual Framework

This study attempted to find out how bilingual teachers use language/s in the different types and contexts of teacher talk in order to come up with implications on the pedagogical guidelines that can be used as a framework for delivering content instruction.

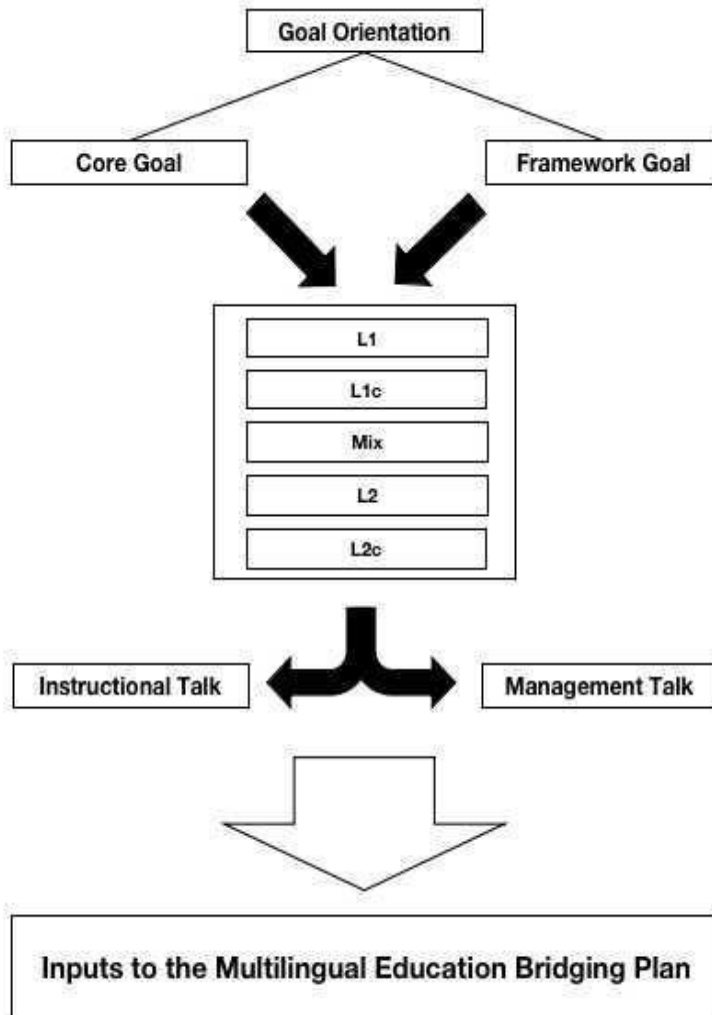
In terms of language use in teacher talk, the present study modified a framework developed by Kim and Elder (2005). In this study, language use was classified into five categories, namely: the unit entirely consists of Filipino (L1) (e.g., *Balik ko lang sa tinatanong ni Francis*); the unit mainly consists of Filipino with one word or morpheme in English (L1c) (e.g., *mamaya ipapakita ko sa inyo 'tong symbol na 'to or walang nalalter sa kanila*); the unit entirely consists of English (L2) (e.g., *This is your rule number one.*); the unit mainly consists of English with one word or morpheme in Filipino (L2c) (e.g., *So uh...sinasabi because of these homologous structures...they show similar genes*) and the unit of is a mixture of Filipino and English to which the above categories of L1c or L2c cannot be applied (Mix) (e.g., *Marami pang tools::ginagamit to determine evolutionary pattern.*).

In terms of the types and contexts of teacher talk, the present study used Doff's (2000) typology. Doff defines teacher talk as the teacher's use of language in the classroom. It

has two types, namely: instructional talk and management talk. Instructional talk refers to the language used by the teacher to present a lesson, while management talk refers to the language used by the teacher to organize classroom activities. These two types are further subdivided into different contexts of use. Instructional talk involves introducing, asking for information, explaining, encouraging, giving direction, correcting, interrupting, introducing material, giving examples, attracting attention, reminding, consolidating, drilling, changing topics, reading students' writing, asking to do something, interpreting, acknowledging, finding out about language, repeating, commenting, checking comprehension, giving suggestion, and dictating. On the other hand, management talk includes greeting, instructing, asking for information, talking/chatting to students, checking attendance, grouping/telling students where to sit, encouraging, giving turn, thanking, apologizing, advising, acknowledging, asking to do something, marking, ending lesson/topic. Figure 1 illustrates the schematic diagram which lays down the conceptual framework of the study.

Figure 1

A Schematic Diagram Showing the Conceptual Framework of the Study



1.6 Scope and Limitations

The study was conducted to describe the language choices in teacher talk of science and mathematics teachers in delivering their content. The study focused on quantifying

language used based on the modified categories of Kim and Elder (2000) as well as the types and contexts of teacher talk (Doff, 2000). The participants of the study were three senior high school teachers of science or mathematics as their subject area in a public senior high school in San Pedro, Laguna, a Tagalog speaking region. The data collection took place from May to June of 2021. Also, because of the circumstances when the study took place, the study limited itself to the online synchronous classroom setup. The data were collected through natural observations, content analysis, and interviews.

1.7 Definition of Terms

The following terms are defined as used in the study which includes the conceptual and operational meaning.

Analysis of Speech (AS Unit). This is an utterance made up of an independent clause unit or a sub-clausal unit, and any associated subordinate clause (Foster et al., 2000). In this study, this was used to segment the teachers' utterances quoted within the confines of the research.

First Language. This refers to the language that a person has been exposed to from birth or within the critical period. It may also be referred to as mother tongue or first language (L1). In this study, the native language of the participants is Tagalog or Filipino.

Instructional talk. This refers to the type of teacher talk used to present or deliver the lesson (Doff, 2000). In this study, it involves giving explanations, directions, corrections, as well as asking and answering questions from students regarding the lesson.

L1. The speech unit mainly consists of Filipino (e.g., *Balik ko lang sa tinanong ni*

Francis)

L1c. The speech unit mainly consists of Filipino with one word or morpheme in English (e.g., *mamaya ipapakita ko sa inyo 'tong symbol na 'to or walang na-alter sa kanila*).

L2. The speech unit entirely consists of Filipinos (e.g., *This is your rule number one.*).

L2c. The speech unit mainly consists of English with one word or morpheme in Filipino (e.g., *So uh...sinasabi because of these homologous structures...they show similar genes*).

Language Alternation. This refers to the speaker's practice of alternating between two or more languages or language varieties, in the context of a single conversation or situation. In this study, it refers to the teacher-participants shifting from Filipino/Tagalog to English or vice-versa or a mixing of the two languages.

Management Talk. This refers to a type of teacher talk used to regulate classroom activities (Doff, 2000). In the study, it refers to utterances involved in greeting, checking responses, instructing, directing, announcing, advising, encouraging, reprimanding, praising, punishing, thanking, humoring, questioning, answering, and closing activities.

Mix. The speech unit is a mixture of Filipino and English, to which categories of L1c or L2c cannot be applied. (e.g., *Marami pang tools::ginagamit to determine evolutionary pattern.*).

Second Language. This refers to the language that a person can speak, that is not the first language learned as a child. It may also be referred to as L2 or target language. In this study, the second language described and utilized under study of the participant

is English.

Teacher Talk. This refers to the teacher's use of language in the classroom. In this study, teacher talk refers to the utterances of the teacher directed toward delivering instruction of managing the class.

CHAPTER 2

METHODOLOGY

This chapter presents the study's methods and design, research site, participant selection, data collection and analysis, role of the researcher, method of validation, and potential ethical issues.

2.1 Research Design

The present study followed the descriptive-qualitative research design. More specifically, it used participant observation as its primary method in which the researcher clearly stated his role as a non-participant observer to the teacher-participants. This research design was deemed fitting for the present study as it aimed to describe a complex phenomenon such as the language used by bilingual science and mathematics teachers in online synchronous classes.

2.2 Research Site

The present study was conducted among Science and Mathematics teachers of a Senior High School in San Pedro, Laguna during the school year 2020-2021. Permission to conduct study was secured and is included in the study. However, this was a period in which face-to-face classes were suspended because of the threat of the Covid-19 pandemic. Likewise, teachers were also discouraged from reporting to school unless they were part of the skeletal workforce or had special tasks to do on-site. Therefore, the observation sessions of the teacher-participants' synchronous classes were done online via Google Meet or Zoom.

2.3 Sampling and Participants

There were two Mathematics and one Science teacher at the Senior High School

during the time of study. All of them agreed to participate in the study. They were selected on the basis of availability. They were selected through criterion sampling or the selection of individuals through a particular predetermined criterion (Hatch, 2002). For the study, the criteria for selection were (1) the teacher should be able to speak and understand Filipino and English; (2)) the teacher should be handling Science, Technology, Engineering, or Mathematics subjects, and (3) the teacher should be available and willing to go under observation. The profile of the teacher-participants are as follows:

Teacher 1 is a licensed electronics and communication engineer rendering her return of service to the government as a Special Science Teacher I from a DOST Scholarship. She was in her third year of service at the school teaching General Mathematics and Basic Statistics courses. Likewise, she has been constantly receiving an annual performance rating of very satisfactory in her teaching performance.

Teacher 2 has more than 10 years of teaching experience in both public and private schools combined. She handles subjects such as Earth Science, General Biology and Research among STEM students. Likewise, she had been constantly receiving an annual performance rating of very satisfactory in her teaching performance.

Teacher 3 has been a mathematics teacher for more than ten years. He has taught Mathematics from elementary to tertiary levels. Likewise, he has been constantly receiving an annual performance rating of very satisfactory in his teaching performance.

2.4 Data Collection

The study employed different methods of data collection, namely: naturalistic observation, content analysis, stimulated recall, and semi-structured interviews. Data triangulation was used in order to validate such instruments and are described in the

validation portion of the study. The participants were initially briefed about the nature and aims of the study. Likewise, they were given formal invitations where the terms and conditions of the research were specified. They were also guaranteed that the data collected would be exclusively used for research purposes and no other. The data were treated with utmost confidentiality and would not affect their performance evaluation at work. Also, since the research was conducted during the implementation of the basic education learning continuity plan because of the Covid-19 pandemic, all observations and interviews were done online.

A naturalistic observation involves observing the participants in their natural context (Nunan, 1992). However, the observation procedure ran from June to July 2021, in which health protocol measures prohibited schools from holding face-to-face or even limited the teachers and other school personnel from reporting to school because of the Covid-19 pandemic. Due to this, the observation sessions were conducted online in which the researcher joined the synchronous online classes held via Google Meet or Zoom. As to the documentation of teacher talk, three synchronous class sessions of each of the three teacher-participants were recorded so as to capture their utterances as they facilitate their classes. Of the three classes, the researcher selected the session which had the longest teacher talk time.

The recorded utterances then were subjected to content analysis, in which the session with the longest teacher talk time were transcribed and segmented into speech units (Foster et al., 2000) and then classified as to the language used, type of teacher talk, and context of use.

To explore the reasons behind each language choice, the researcher conducted a series

of stimulated recall. A stimulated recall is a technique in which the researcher records and transcribes parts of the lesson and then gets the teacher-participants to comment on what was happening (Nunan, 1992). In this study, the stimulated recall sessions were also conducted online. The researcher and the teacher participants watched and reviewed the recorded synchronous online class session. Each time, the teacher participant switched language, the researcher asked for the reasons behind such switch.

In addition, a group interview was also facilitated by the researcher. This provided a secondary source of data that is often used to enrich data collected in qualitative studies (Hatch, 2002). The questions for the interview were validated by three experts to ensure that they were free from biases (e.g., gender, class, ethnic, and cultural). The experts were given validation sheets where they indicated whether the questions were acceptable, rejected, or needing revision.

2.5 Data Analysis

The recorded data were transcribed by the author himself. Then, the Analysis of Speech Units, or AS Units (Foster et al., 2000) was used in segmenting the recorded teacher utterances. An AS-unit is a single utterance consisting of an independent clause or sub-clausal unit, together with any subordinate clauses associated with either. The segmented teacher utterances were then analyzed according to the language used, type of teacher talk, and contexts of use.

In terms of language used by the teacher-participants, each AS unit was categorized in terms of L1, L1c, L2, L2c, or Mix.

Then, in terms of the type of teacher talk, each AS unit was classified as either instructional talk or management talk.

Lastly, in terms of context of use, each unit was classified into the different contexts of instructional talk (e.g., asking for information, explaining, introducing material, etc.) and management talk (e.g., giving turn, greeting, talking/chatting with students, etc.). The data from the stimulated recall and group interview were coded and thematically analyzed.

2.6 Role of the Researcher

The researcher took the role of observer-as-participant in which he identified himself as a researcher but made no pretense of being a member of the group being observed. In classroom research, this allowed him to conduct interviews with the teacher-participants, talk with their immediate superior, and even their students.

2.7 Method of Validation

The study was qualitative and did not attempt to establish a causal relationship or generalization. Therefore, the issue of validity was not a concern (Nunan, 1992). However, the researcher observed data triangulation by employing more than one means of data collection and analysis, namely: naturalistic observation, content analysis, and stimulated recall.

2.8 Potential Ethical Issues

The research did not pose physical or psychological harm to the teacher participants. Nor did it entail any deception of any sort. However, since the study involved video-recording the participants' teaching performance in the classroom, the researcher observed data confidentiality. Also, their recorded performance was exclusively used for the study and not as a basis for the appraisal of their job performance.

Once study has been completed and defended, a copy of the manuscript was given to a) the teacher-participants, b) the school, and c) the Schools Division Office of Laguna.

The researcher found ways to share the results of the study during learning action cell sessions, research conferences, symposia, and I.

CHAPTER 3

FINDINGS AND DISCUSSIONS

This chapter presents the discussion of the data divided into seven major parts: language preference, types of teacher talk, contexts of teacher talk, language use in teacher talk, language use in the different contexts of teacher talk, language alternation in teacher talk, and suggerter inputs to the existing multilingual education bridging implementation plan.

3.1 Teachers' Preferences in Teacher Talk

3.1.1 Language Use in Teacher Talk

Table 1 illustrates the preference of teachers for language use:

Table 1

Teachers' Preference for Language Use

Language	Teacher 1		Teacher 2		Teacher 3	
	f	%	F	%	F	%
L1	24	12	41	8.2	73	6.58
L1c	31	15.5	43	8.6	69	6.21
Mix	94	<u>47</u>	125	25	383	34.5
L2	46	23	285	<u>57</u>	549	<u>49.5</u>
L2c	5	2.5	6	1.2	36	3.24
TOTAL	200	100	500	100	1110	100

Table 1 shows the language/s that the teacher-participants used in teacher talk utterances. The data show that the teachers used different languages to varying degrees. Teacher 1 used Mix (47%), while Teachers 2 and 3 mostly used L2 (57% and 49.50% respectively) in their utterances. Nevertheless, all teachers rarely used L2c (2.50%, 1.20%,

and 3.24% respectively). These findings somehow differ from that of Domalewska (2017), in which she found out that teachers used L1 (Thai) with frequent switches to L2 (English) in the classroom. Meanwhile, the Mix category placed the second most used type of language used by Teachers 2 and 3.

Likewise, the above findings are consistent with the data extracted from the group interview. While all teachers consider themselves as either proficient or highly proficient in Filipino, they seem to have varying perceptions of their English proficiency levels. The teacher-participants' perception of their competency in English somehow supports the findings of Meniado (2019) which claims that Filipino teachers were found to be at the intermediate or upper intermediate levels of English proficiency. Thus, they have a fairly good command of the English language to deliver instructions.

Um, I would say, same with Ma'am Ann, fluent din ako when it comes to speaking Filipino or Tagalog though may mga times na 'pag nagsasalita talaga napapaTaglish, napapagalaw ang Tagalog at English. May time na hindi ko maalala ang Tagalog ng English word. So ayon I think proficient din naman. (Teacher 1)

Umm, as a speaker of Filipino or Tagalog basically I gauge myself as a fluent Filipino speaker because both of the sides of my Family wala naman silang regional dialect. Talagang Filipino. Batangueño. Malalim ang Tagalog. So I could say that I could speak the language very well. Wala akong nakikitang difficulty to understand common Tagalog words and translate them to or integrate them in any conversation. So ayon highly competent naman highly proficient (Teacher 2)

Um, sa akin, as a speaker of Filipino, masasabi ko na proficient naman ako pero may mga pagkakataon na syempre may mga terms ako, dahil hindi naman in the first place yung Filipino yung first, native, language ko. Ilokano, Ibanag. Ganoon. So may pagkakataon na yung mga terms ay medyo hindi tama ang bigkas. (Teacher 3)

"...as a speaker of English, I won't say I'm very fluent to be honest because when I was in elementary ayaw na ayaw ko talaga ng English kaya sometimes I had a hard time speaking English fluently." (Teacher 3)

"Comfortable naman ako as a speaker of the English language. My mom is a teacher so she taught us at a very young age..." (Teacher 2)

"Iyong sa akin, hindi ko masasabi na ganun ako ka-fluent. Um, feeling ko kailangan ko pang matuto para makapagsalita ang English ng maayos. Siguro kung ira-rank ko being ten is the highest, mga five." (Teacher 3)

As illustrated by the data from the utterances of Teachers 2 and 3, the extensive use

of English may be attributed to their belief that they should use English as the medium of instruction in their respective subject matter. However, despite trying to conduct the class in English, they would occasionally shift to Filipino and vice-versa. This practice may be attributed to their attempt to adjust to the learners' proficiency in the L2. In order to ensure the comprehension of the lesson, the teacher participants sometimes use the language which they think would facilitate maximum comprehension as shown in the extracts below.

"...and I think mas maintindihan ng mga bata yung lesson kapag finiFilipino mo." (Teacher 1)

...that's why in reinforcing my instructions, if they could not get it in English, I would reinforce it in Filipino. More often than not, they could not really grasp the instructions in English. You have to rephrase it or to redirect it in Filipino or Tagalog para maintindihan. (Teacher 2)

"...pero hindi ko maiwasan na during discussion ay nakakapagsalita ako ng Filipino lalo na kapag halimbawa may mga terms ako na sa tingin ko , kaya ko nagtaTagalog at para mas maintindihan nila 'ang gusto kong sabihin." (Teacher 3)

These findings support studies which claim teachers find the use of L1 in the classroom inevitable despite believing that it may impede the development of L2 Tan (2017). However the prevalence of L2 in their classes suggests support for the claim of Erk (2017) which states that the use of L1 is more often used in the lower grade levels than in the higher levels of schooling. Since the teacher-respondents teach at the senior high school level, their use of L1 in the classroom also lessens. Also, since they are teaching senior high school students, they may be expecting that the learners have sufficient skills to understand instructions delivered in English. This supports the findings of Yap et al. (2017) which claims that teachers' use of L1 in the classroom is also determined by their perceived level of English language competence of their students.

3.1.2 Types of Teacher Talk

Table 2 lays down the teachers' preferences for the types of teacher talk:

Table 2

Teachers' Preferences for the Types of Teacher Talk

Type of Teacher Talk	Teacher 1		Teacher 2		Teacher 3	
	f	%	F	%	F	%
Instructional Talk	<u>100</u>	50	<u>326</u>	65.2	<u>1040</u>	93.69
Management Talk	<u>100</u>	50	174	34.8	70	6.31
TOTAL	200	100	500	100	1110	100

Table 2 shows that while Teacher 1's talk was equally composed of instructional talk (50%) and management talk (50%), Teachers 2 and 3's talks were mostly instructional (65.20% and 93.69% respectively). These somehow support the findings of Nasir et al. (2019) which claim that teachers mostly talk to directly influence the students by lecturing, directing, criticizing, among others, than indirectly influencing them through accepting feelings, praising, and encouraging. However, the present findings contradict that of Zulfa et al. (2015), which claims that teacher talk is mostly used for managing the class instead of instructions. However, it is worth remembering that the present context of the study took place in science and mathematics classes as compared to the aforementioned study which took place in language classes. Moreover, it was observed that there were less student interruptions in online synchronous classes. This was also manifested in the interviews with teachers, in which they confirmed that their talks were mostly directed toward delivering content instruction than managing the class.

3.1.3 Contexts of Teacher Talk

Table 3 presents the teachers' preferences for the contexts of instructional talk:

Table 3

Teachers' Preferences for the Contexts of Instructional Talk

Context of Instructional Talk	Teacher 1		Teacher 2		Teacher 3	
	f	%	f	%	F	%
Acknowledging	0	0	3	0.92	74	7.16
Asking for information	0	0	21	6.44	66	6.35
Explanation	50	50	187	57.36	541	52.02
Introducing new material	13	13	16	4.91	33	3.17
Reminding	12	12	27	8.28	78	7.5
Other contexts	25	25	72	22.09	248	26.96
TOTAL	100	100	326	100	1040	100

Note. See Appendix G to view the complete data set.

Table 3 shows that Teachers 1, 2, and 3 mostly used instructional talk to *explain* (50.00%, 57.36%, and 52.02% respectively). Other than this, Teacher 1 used it to *introduce new material* (13%) and *remind* (12%); Teacher 2 used it to *remind* (8.28%) and *ask for information* (6.44%); and Teacher 3 used it also to *remind* (7.50%) and to *acknowledge* (7.16%). These somehow support the findings of Mukarromah et al. (2021), in which they found out that lecturing comprised 35% of the direct teacher talk. This can be equated with the *explaining* category in Doff (2000). Likewise, it also supports that of Nasir et al. (2019) in which data show that senior high school teacher talk is mostly used to give directions and ask questions. This particular instructional context was reflected in the interviews with some of the teacher-participants as shown in the interview transcripts below.

“Kasi ‘pag ang bata tinatanong mo’t wala nang sumasagot ibig sabihin may mali dyan. So, I think ‘yun na yung time para sa akin i-explain mo na yung topic mo ‘yun in Filipino.”(Teacher 2)

Pero hindi ko maiwasan during discussion ay nakakapagsalita ko ng Filipino lalo na kapag halimbawa may mga terms ako na sa tingin ko mahirap sa kanila kung English sasabihin. So, sa tingin ko, kaya ko nagta-Tagalog ay para mas maintindihan nila ‘ang gusto ko sabihin.(Teacher 3)

Table 4 likewise presents the teachers’ preferences for the contexts of management talk:

Table 4

Teachers’ Preferences for the Contexts of Management Talk

Context of Management Talk	Teacher 1		Teacher 2		Teacher 3	
	f	%	f	%	F	%
Asking to do something	20	20	21	12.07	2	2.86
Encouraging	14	14	<u>53</u>	30.46	9	12.86
Giving turn	1	1	0	0	12	17.14
Instruction	20	20	10	5.74	7	10
Talking/Chatting with students	<u>29</u>	29	45	25.86	<u>22</u>	31.43
Other contexts	16	16	45	25.86	18	25.71
TOTAL	100	100	174	100	70	100

Note. See Appendix H to view the complete data set.

Table 4 shows that Teachers 1 and 3 mostly used management talk to *talk/chat with students* (29% and 31.43% respectively), while Teacher 2 used it to *encourage students* (30.46%). Other than these, Teacher 1 used it to *instruct* (20%) and *ask students to do something* (20%); Teacher 2 used it to *talk/chat with students* (25.86%) and *ask them to do something* (12.07%); and Teacher 3 used it also to *give turn to students* (17.14%) and *encourage* (12.86%). These somehow support the findings of Mukarromah et al. (2021) which claims that in terms of management talk, teachers would often use it to *encourage* students. Moreover, it also supports the findings of Nasir et al. (2019) claiming the teacher talk is mostly used to give directions, ask questions, and give praise and encouragement.

As shown in the extracts below, some of these were also reflected in the interviews with some of the teacher-participants, more particularly in the contexts of *instructing* and *encouraging*.

That's why in reinforcing my instructions, if they could not get it in English I would reinforce it in Filipino. More often than not, they could not really grasp the instructions in English. You have to rephrase it or to redirect it in Filipino or in Tagalog para nila maintindihan. (Teacher 2)

...yung ibang bata kasi kapag pure English yung teacher, napapansin ko na takot na rin magrecite. Feeling nila kailangan rin nila magsalita in English kaya ganun na rin ang ginagawa ko. Nag Filipino ako para at least alam din 45ustin binibigyan ko rin sila ng chance na magsalita in Filipino kapag nag rerecite sila. (Teacher 1)

3.2 Language Use in Teacher Talk

3.2.1 Language Use in the Different Types of Teacher Talk

Table 5 details the language used in the different contexts of teacher talk.

Table 5

Teachers' Language Use in the Different Types of Teacher Talk

Type of Teacher Talk	Language	Teacher 1		Teacher 2		Teacher 3	
		f	%	F	%	F	%
Instructional	L1	3	3	20	6.13	59	5.67
	L1c	6	6	27	8.28	59	5.67
	Mix	65	65	99	30.37	365	35.1
	L2	25	25	176	53.99	521	50.1
	L2c	1	1	4	1.23	36	3.46
Management	L1	21	21	21	12.07	14	20
	L1c	25	25	16	9.2	10	14.29
	Mix	29	29	26	14.94	18	25.71
	L2	21	21	109	62.63	28	37.14
	L2c	4	4	2	1.15	0	0
TOTAL		200	100	500	100	1110	100

According to the table, Teacher 1 mostly used Mix in both instructional (65%) and management talk (65%). On the other hand, Teachers 2 and 3 mostly used L2 in both instructional (53.99% and 50.01% respectively) and management talk (62.63% and 37.14% respectively). It appears that the teachers' choice of language is consistent regardless of whether it is used for instructional or management type of teacher talk. Likewise, it appears that among the teachers, L2c was the least used in the talks both in instructional and management talks. These findings somehow contradict that of Rosalina (2021) in which data show that the native language is more often used in both instructional and management talks. However, such findings can be explained by its context. While the aforementioned study was done at the elementary level, the present study was conducted among senior high school students. Erk (2017) explained that teachers mostly used the students L1 in the lower levels than in the higher levels of schooling.

In addition, data from the group interview reveal that all teachers had to resort to translating their utterances from English to Filipino for them to be better understood. As shown in the extracts below, this happens both in delivering content instructions and managing the class.

Based on my observation nga may mga students 46ustin hirap macomprehend lalo na 'pag problem ang binibigay sa mga bata. So ginagawa ko, same din with Ma'am Ann and Sir Teel, English muna and then kailangan kong i-translate in Filipino para mas maintindihan nung mga bata kasi mahirap naman kung hindi masosolve nung bata kung ano yung hinahanap sa problem or kung ano yung given sa problem... (Teacher 1)

"(in managing the class) ...more often, it's a sad thing. More often than not, they could not really grasp instructions in English. You have to rephrase it or redirect it in Filipino or in Tagalog para nila maintindihan." (Teacher 2)

...talagang ang math English din talaga dapat 'yan. Lalo sa akin, based on my experience, sa lahat ng mga naturuan ko masasabi ko sa discussion naman ay English naman pero unconsciously hindi naman natin maiwasan na kahit anong gusto natin 'di 46usti plan natin puro English pero unconsciously nakakapagsalita talaga tayo ng Tagalog. (Teacher 3)

3.2.2 Language Use in the Different Contexts of Teacher Talk

Table 6 presents the language used in the contexts of instructional talk.

Table 6

Language Use in the Contexts of Instructional Talk

Context of Instructional Talk	Language	Teacher 1		Teacher 2		Teacher 3	
		F	%	F	%	F	%
Acknowledging	L1	0	0	0	0	5	0.48
	L1c	0	0	0	0	0	0
	Mix	0	0	0	0	4	0.38
	L2	0	0	<u>3</u>	0.92	<u>64</u>	6.15
	L2c	0	0	0	0	1	0.1
Explaining	L1	0	0	13	3.99	30	2.88
	L1c	0	0	19	5.83	40	3.85
	Mix	<u>41</u>	41	61	18.71	<u>242</u>	23.3
	L2	9	9	<u>90</u>	27.61	210	20.19
	L2c	0	0	4	1.23	19	1.83
Reminding	L1	0	0	1	0.31	2	0.19
	L1c	0	0	0	0	6	0.58
	Mix	<u>11</u>	11	10	3.07	<u>41</u>	3.94
	L2	1	1	<u>16</u>	4.91	28	2.69
	L2c	0	0	0	0	1	0.1
Other contexts		38	38	109	33.43	337	32.40
TOTAL		100	100	326	100	1040	100

Note. See Appendix G to view the complete data set.

Table 6 details the language used in the different contexts of instructional teacher talk. Teacher 1 mostly used Mix in *explaining* (41%) and *reminding* (11%). Likewise, she often used L2 in *explaining* (9%). Teacher 2 regularly used L2, Mix, and L1c in *explaining* (27.61%, 18.71%, and 5.83% respectively). Teacher 3 used Mix in *explaining* (23.27) and L2 in *explaining* (2.19%) and *acknowledging* (6.15%). Other notable contexts are *commenting* and *introducing material*. These findings somehow support that of Domalewski (2017) in which data show that teachers use a mix of languages in substituting, emphasizing, and clarifying concepts. Thus, teachers use all language resources available for the delivery of the lesson content. Again, in the interviews, all teacher-participants believe that science and mathematics should mostly be taught using English. This is evident in their responses during the group interview as shown in the following extracts:

“Kapag magdidiscuss ka or magprepresent ka, kailangan in English...” (Teacher 1)

“I use English... ‘pag nag dedevelop ako ng lesson, whenever I throw questions during the discovery approach especially ‘paggamit ko yung strategy na ‘yun...” (Teacher 2)

“Sa akin, based on my observation sa sarili ko na kinakailangan English talaga sa discussion kasi kailangan eh sa math iyon talaga ang required dapat ang discussion natin in English...” (Teacher 3)

Table 7 presents the use of language in the contexts of management talk.

Table 7

Language Use in the Contexts of Management Talk

Context of Management Talk	Language	Teacher 1		Teacher 2		Teacher 3	
		f	%	f	%	f	%
Asking to do something	L1	1	1	1	0.57	0	0
	L1c	<u>11</u>	11	0	0	0	0
	Mix	6	6	1	0.57	<u>2</u>	2.86
	L2	2	2	<u>19</u>	10.1	0	0
	L2c	0	0	0	0	0	0
Encouraging	L1	6	6	8	4.6	<u>5</u>	7.14
	L1c	0	0	7	4.02	2	2.86
	Mix	2	2	4	2.3	2	2.86
	L2	6	6	<u>34</u>	19.54	0	0
	L2c	0	0	0	0	0	0
Giving turn	L1	0	0	0	0	1	1.43
	L1c	0	0	0	0	1	1.43
	Mix	0	0	0	0	0	0
	L2	1	1	0	0	<u>10</u>	14.29
	L2c	0	0	0	0	0	0
Instructing	L1	0	0	1	0.57	1	1.43
	L1c	0	0	0	0	2	2.86
	Mix	<u>14</u>	14	3	1.72	1	1.43
	L2	5	5	<u>6</u>	3.45	3	4.29
	L2c	1	1	0	0	0	0

(continued)

Table 7 (continued)*Language Use in the Contexts of Management Talk*

Context of Management Talk	Language	Teacher 1		Teacher 2		Teacher 3	
		f	%	f	%	f	%
Talking/chatting with students	L1	19	19	9	5.17	4	5.71
	L1c	11	11	3	1.72	5	7.14
	Mix	5	5	13	7.47	7	10
	L2	1	1	18	10.34	6	8.57
	L2c	1	1	2	1.15	0	0
Other contexts		8	8	45	25.86	24	34.28
TOTAL		100	100	174	100	70	100

Note. See Appendix H to view the complete data set.

Table 7 details the language used in different contexts of management teacher talk. Teacher 1 mostly used Mix in *instructing* (14%), L1c in *asking students to do something* (11%) and *talking/chatting with students* (11%). Teacher 2 often used L2 in *encouragement* (19.54%), *asking students to do something* (10.92%), and *talking and chatting with students* (10.34%). Lastly, Teacher 3 spent most of his management talk using L2 in *giving turns* (14.29%) and *talking/chatting with students* (8.75%) and Mix in *talking/chatting with students* (10%). It appears that even in managing the class, the teacher-participants still use L2 most of the time. This appears to be contrary to the findings of Alrabah et al. (2016) claiming that L1 is most efficient in functions such as test administration and maintenance of classroom order. Moreover, this finding counters their claim in the interviews.

...ako sa pagdidisiplina sa mga bata kasi uba yung dating ewan ko iba yung dating kapag dinideliver siya in Tagalog compared sa English. 'Pag English kasi ang lumanay na sosyal pakingan kaya parang 'yung ibang bata parang 'di na masyadong ganoon sila seryoso compared kapag nagtaTagalog and teacher lalo kapag dating sa sinsaway sila or

dinidisiplina. And isa din yung pag napansin mo na wala ng sumasagot sayo or kasi 'pag ang bata tinatanong 51usting ng sumasagot ibig sabihin may maki diyan. It's either hindi nila maintindihan 'yung lesson or nahihiya 'yan... (Teacher 1)

More often than not aaah I 'pag sa discipline inside my classroom, I address it in Filipino kasi parang tagos na tagos na may gusto akong mangyari inside the classroom. 'Yon so when I'm faced with discipline issues, I address it in Filipino... (Teacher 2)

Sa akin kasi pansin ko sa part ng classroom management. Halimbawa pagtawag ako "Oh, sino 51usting mag recite?" Tagalog talaga "Bakit 'yung iba hindi ko nararamdaman?" so Tagalog talaga 'yung instruction ko. And then kapag naghahanap most of the time talaga in Filipino... (Teacher 3)

While reprimanding did not mark significantly prominent in the teachers' management talk, qualitative data appears to validate that when it comes to managing students' behavior, the teachers use the learners' L1. This perhaps suggests that when there is an immediate need for teachers to manage the classroom atmosphere by influencing the students' behavior, the most accessible language is to be used. This supports the findings of Rosalina (2021) which claim that reprimands are often delivered in the native language.

3.3 Reasons for Language Alternations in Teacher Talk

Table 8 provides the reasons for language alterations in teacher talk.

Table 8

Reasons for Language Alternations in Teacher Talk

Themes	Core Ideas and Supporting Quotes
Learner consideration	Core Idea The teacher-participants gauge their learners' ability to comprehend the lesson and express themselves.

(continued)

Table 8 (continued)

Reasons for Language Alternations in Teacher Talk

Themes	Core Ideas and Supporting Quotes
	Supporting Quotes <i>“...mas naiintindihan ng mga bata yung Filipino kasi yung iba napapansin ko naman sa mga students ko medyo yung iba hiras sila sa comprehension lalo na kung English yung problem sa math, so kailangan medyo i-translate mo into English.” (Teacher 1)</i> <i>That’s why in reinforcing my instructions, if they could not get it in English I would reinforce it in Filipino. More often than not, they could not really grasp the instructions in English. You have to rephrase it or to redirect it in Filipino or in Tagalog para nila maintindihan. (Teacher 2)</i> <i>“And I think mas naiintindihan ng mga bat yung lesson kapag finiFilipino mo.” (Teacher 3)</i>
Content enrichment	Core Idea Teachers need to shift to Filipino in order to enrich the lessons by providing explanations, contextualizing, and integrating values. Supporting Quotes <i>“But there are times, when I teach STEM, especially if it is a Science, Technology, and Society issue, eh mag-iintegrate ako ng Filipino setting I would rather use the Filipino language.” (Teacher 2)</i> <i>Kapag integrative approach, valuing approach ibig sabihin ginagamit ko yung mga examples ng lokal, o kaya naman pangyayaring lokal o Filipino talaga, the Filipino community is involved, ginagamit ko talaga all throughout. Di ako nag-e-English, Tagalog talaga. ‘Yung mga issue na kailangan nila maramdaman sa kalooban nila. (Teacher 2)</i> (continued)

Table 8 (continued)

Reasons for Language Alternations in Teacher Talk

Themes	Core Ideas and Supporting Ideas
Instructional development	Core Idea The teacher-participants claim to use Filipino to better the facilitation and transmission of knowledge, and efficient facilitation of the class. Supporting Quotes <i>“Kasi ‘pag ang bata tinatanong mo’t wala nang sumasagot ibig sabihin may mali dyan. So, I think ‘yun na yung time para sa akin i-explain mo na yung topic mo ‘yun in Filipino.” (Teacher 2)</i> <i>Pero hindi ko maiwasan during discussion ay nakakapagsalita ko ng Filipino lalo na kapag halimbawa may mga terms ako na sa tingin ko mahirap sa kanila kung English sasabihin. So, sa tingin ko, kaya ko nagta-Tagalog ay para mas maintindihan nila ‘ang gusto ko sabihin. (Teacher 3)</i>
Interaction facilitation	Core Idea The teacher-participants claim that using Filipino or allowing the students to use Filipino makes them more engaged in class discussions and activities. It also makes the class more collaborative and interactive. Supporting Quotes <i>...yung ibang bata kasi kapag pure English yung teacher, napapansin ko na takot na rin magrecite. Feeling nila kailangan rin nila magsalita in English kaya ganun na rin ang ginagawa ko. Nag Filipino ako para at least alam din ila na binibigyan ko rin sila ng chance na magsalita in Filipino kapag nag rerecite sila. (Teacher 1)</i> <i>“walang sumasagot kailangan mong i-Tagalog para at least alam nila na pwede silang magsalita in Tagalog kapag nag-recite.” (Teacher 2)</i>

Table 8 presents the reasons that the teacher-participants stated as to why they would occasionally use L1 in their classes. While the quantitative data shows that the teacher-participants adhere to the use of L2 in their classes as much as possible, it seems that the use of L1 is inevitable and may even be considered essential in the teaching of content subjects such as science and mathematics. The data generated four themes, namely: learner consideration, content improvement, instructional development, and interaction facilitation.

In terms of learner consideration, findings show that the teacher-participants would occasionally use L1 in consideration of their learners' ability to comprehend the lesson. This is supported by the study of Domingo (2015) which claims that use of the learners' L1 in a content subject such as mathematics results in better understanding of the lesson.

In terms of content enrichment, the teacher-participants claimed they sometimes need to shift from English to Filipino in order to clarify some parts of the lesson by providing explanations, contextualizing, and integrating values. This is consistent with the findings of Garcines and Alvarez (2017) which claim that teachers sometimes use L1, usually in the form of code-switching, to highlight the important parts of the lesson and inject humor during lectures and discussions.

As for instructional enhancement, the teacher-participants claim to use Filipino to better facilitate the conduct of class activities. This is consistent with the findings of Li (2018) which claims that teachers use L1 to prompt students to encourage participation, prompt them to correct themselves and give instructions efficiently.

Lastly, teachers use L1 to facilitate interaction in the classroom. The teacher-participants claim that using Filipino or allowing the students to use Filipino makes them

more engaged in class discussions and activities. It also makes the class more collaborative and interactive. This supports the findings of Alrabah et al. (2016) which claim that using L1 creates a non-threatening class atmosphere and it also results in a more productive classroom environment. Likewise, it supports the findings of Li (2018) which claim that the teachers' use of the learners' L1 encourages class participation.

3.4 Inputs to the Existing Multilingual Education Bridging Plan

Based on the data from the group interview, the researcher has generated the following suggestions to the following pedagogical guidelines for bilingual teachers in the use of L1 and L2 in science and mathematics classes as laid down in Table 9. They are:

Table 9

Suggested Inputs to the Existing Multilingual Education Implementation Plan

Themes	Core Ideas and Supporting Quotes
The Use of L1(Filipino) in Instructional Talk	Core Idea Teachers can highlight important parts of the lesson by initially stating them in the L2 and then translating, restating, or interpreting them in the L1. This may be used for important concepts, instructions, procedures, and directions should be in the L1. This helps clarify vague areas of the lesson, affirm students' understanding, and ensure comprehension among students. Supporting Quotes <i>Makikita mo naman 'yun sa mga reaction ng mga bata that we have to use more simpler terms or more common terms or 'yung sinasabi nilang layman's terms instead na yung mga scientific jargons. I would simply the words I use.. more often you have to rephrase it and use Tagalog... kaya ayung nga English nga 'yung problem pero kailangan pa ren i-Tagalog. (Teacher 1)</i>

(continued)

Table 9 (continued)*Suggested Inputs to the Existing Multilingual Education Implementation Plan*

Themes	Core Ideas and Supporting Quotes
The Use of L1(Filipino) in Instructional Talk	<i>“English muna then kailangan ko itranslate sa Filipino para mas maintindihan naman ng mga bata. Hindi masosolve ng mga bata ‘ang problema kung di maintindihan.” (Teacher 2)</i>
	<i>“Kahit anong pilot nation, hindi-hindi natin maiiwasan ang makakapag-explain tayo ng lesson natin sa Math in Filipino or in Tagalog.” (Teacher 3)</i>
	<i>“Iyong instructions na nakalagay sa slides ay in English pero Tinatagalog ko pa rin siya.”(Teacher 1)</i>
	Core Idea Teachers can use the L1 in talking about local terms and concepts that may not have an equivalent in the L2. This will make the discussion easier by using terms or concepts more familiar or common to both teachers and students, thus making the lesson much closer to the students’ understanding. Supporting Quotes <i>“Sa tingin ko kaya nagta-Tagalog ako ay para mas maintindihan nila ‘yung ibig kong sabihin. Kasi sa discussion may biglang papasok na wala sa plan kaya napapa-Tagalog.” (Teacher 1)</i> <i>“May mga pagkakataon kasing mas madali siyang e-explain pag-Tagalog ginagamit ko. Saka mas confident din sila (students) kapag Tagalog.” (Teacher 2)</i> <i>“Halimbawa ang issue ay in Filipino at nangyayari sa Pilipinas, eh dapat ang gamitin kong lenggwahe ay Filipino so they (students) could react.” (Teacher 3)</i>
The Use of L1(Filipino) in Management Talk	Core Idea
	Teachers can express words of encouragement and praise in the L1. This gives such statements more appeal to the students’ affect. This also assures the learners that they are acknowledged, hence inspires them to participate actively in the lesson leading to a more active session.

(continued)

Table 9 (continued)*Suggested Inputs to the Existing Multilingual Education Implementation Plan*

Themes	Core Ideas and Supporting Quotes		
The Use of L1(Filipino) in Management Talk	Supporting Quotes <i>“Sa kanila (students) nakikita ko na-encourage silang mag participate. It is prompting students to perform.”(Teacher 1)</i> <i>“Kunwari nanaway tayo, ‘di naman pwede na pwede pati don English na ang gamit. May halo ring Tagalog.” (Teacher 2)</i> <i>“Learning is not just from the head, but from the heart as well.I find it more meaningful if they could express ‘yung sarili nila ‘in their own right.” (Teacher 2)</i> <i>“Kapag wala ng sumasagot 57ay o. Kasi kapag ang bata ‘pag tinatanong mo walang sumasagot may mali dyan. It’s either di nila maintindihan ang lesson or nahihiya ‘yan.” (Teacher 3)</i> Core Idea Teachers can use the students’ L1 in discussing the affective component of the lesson. This refers to the part of the lesson where teachers extract moral values from the topics. Such aspects are best conducted in the students’ L1 as it would sound more profound, sincere, and earnest to the learners. Supporting Quotes <i>“Pagdating doon sa valuing, I address that in Filipino.”</i> <i>“Ako kasi naniniwala akong maintindihan nila, meron lang hesitation kasi they are afraid to commit mistakes.”</i> <i>“Sa pagdidisiplina, nangangaral nagtatagalog ako. Kasi iba ‘ang tunog kapag Filipino. Kapag English, ang sosyal pakinggan kaya yung ibang mga bata hindi nila gaano sineseryoso.”</i> <td>The Use of L2 (English) in Instructional Talk</td> <td> Core Idea Teachers can do the initial presentation and explanation of concepts, topics, activities, directions, and questions in the target language. This is practiced since instructional and assessment materials are mostly written in the L2 (English). Also, this is in adherence with the current language policy. </td>	The Use of L2 (English) in Instructional Talk	Core Idea Teachers can do the initial presentation and explanation of concepts, topics, activities, directions, and questions in the target language. This is practiced since instructional and assessment materials are mostly written in the L2 (English). Also, this is in adherence with the current language policy.

(continued)

Table 9 (continued)

Suggested Inputs to the Existing Multilingual Education Implementation Plan

Themes	Core Ideas and Supporting Quotes
The Use of L2 (English) in Management Talk	Supporting Quotes <i>“Sa discussion naman ay English naman. Kinakailangan English kasi yun ang required na ang discussion natin ay in English”</i> <i>“But the concept part of the lesson should be in English.”</i> <i>“Dapat talaga English, ever since naman, kahit elementary tayo ang discussion sa Math ay English talaga.”</i> <i>“Asking questions and reinforcement, don ako nag0-English.”</i> <i>“Well sa akin kasi, kapag nagtuturo ka in English ng Math and sa Science na rin, natututo na yung bata ng Math and Science, gumagaling din sila sa English.”</i>
	Core Idea Teachers can facilitate class routines such as greetings and checking of attendance in the L2 because these are conventional classroom protocols that are easily understood.
	Supporting Quotes <i>“Nagstart talaga ko in English, class attendance, review to motivation.”</i> <i>“Especially laboratory instructions, I have to state it in English and repeat it in Tagalog.”</i> <i>“Ako kasi naniniwala akong maintindihan nila, meron lang hesitation kasi they are afraid to commit mistakes. ”</i> <i>“More often than not ‘pag sa discipline sa classroom, I address it sa Filipino kasi parang tagos na tagos na parang may gusto mong mangyari sa inyo class. So iyon”</i>
	(continued)

Table 9 (continued)*Suggested Inputs to the Existing Multilingual Education Implementation Plan*

Themes	Core Ideas and Supporting Quotes
	Core Idea Teachers can wrap up or end the sessions in the L2 to emphasize or reinforce the idea that English is essentially the medium of instruction in science and mathematics classes. Supporting Quotes <i>“Review of lesson should be in English kasi that was previously taught na kaya kailangan at least ‘yong mga terms don wala na silang problema.”</i> <i>“At saka nakabisado na natin yung discussion so madali na lang in-English.”</i> <i>“May part don na scripted, ‘goodbye class see you tomorrow’ ayun nakakabisado mo na so English.”</i> <i>“Kumbaga kabisado mo na kasi, so sasabihin mo na rin siya in English.”</i>

Table 9 presents the suggested inputs to the existing multilingual education bridging plan. Data were generated through a group interview with the teacher-participants. There were four themes, namely: the use of L1 in instructional talk, the use of L1 in management talk, the use of L2 in instructional talk, and the use of L2 in management talk.

As for the use of L1 in instructional talk, data show that the learners’ L1 can be used in the repetition of important concepts, instructions, procedures, and directions. This can be done by uttering such statements in the target language then restating or rephrasing them in the students’ L1. Through this, the teacher is able to use the target language and validate students’ understanding of the statement by translating the statements in a more

common or familiar language. This helps clarify vague areas of the lesson, affirm students' understanding, and ensure comprehension among students. This is related to the findings of Garcines and Alvarez (2017) that the use of L1, in the form of code-switching, is an efficient means of putting emphasis on the important parts of the lesson. Such is also stated by De La Campa and Nassiji (2009) in which code-switching is commonly used by teachers to make clarifications. In addition to the reiteration of the important parts of the lesson, L1 can also be used to discuss local concepts. This helps teachers to get the lesson much closer to the students' understanding. This supports the claim of Baker (2006) which states that L1, in the form of code-switching can be used to explain an unknown word or concept in the target language.

As for L1's use in management talk, words of encouragement and praises have more emotional appeal to the learners when they are delivered in a language more familiar to them. By doing this, learners can feel that they are acknowledged, hence encouraging them to participate actively in the lesson leading to a more engaged class session. Likewise, the affective component of the lesson, such as valuing and discipline, is better given in the L1 to sound more profound, sincere, and earnest among learners. These somehow support the claim of Alrabah et al. (2016) that teachers' use of L1 creates a non-threatening and non-intimidating class environment. Moreover, teachers using the students' L1 can also establish identification with the students' linguistic group.

As for the role of the learners' L2 (English) in instructional talk, it is worth remembering that English is still what the teacher-respondents consider as the language that should be used in class discussion, at least in their respective subject matter. Hence, it is still to be used in the initial presentation of concepts, topics, activities, directions, and

questions to check the learners' understanding. Afterall, learning and assessment materials in science and mathematics are written in English. Lastly, it can also be used in the facilitation of class routines such as greetings, checking of attendance, task compliance, and maintaining session orders should be in the L2 because these are conventional online class protocols that are universally understood. Likewise, it can be used in wrapping up and ending the sessions to emphasize and reinforce the idea that English is essentially the medium of instruction in science and mathematics classes. All these findings are consistent with the claim of Stoller (2002) regarding the importance of extended input in content-based language classrooms where students are exposed to meaningful and purposive inputs of the target language.

CHAPTER 4

SUMMARY, CONCLUSIONS, RECOMMENDATIONS

This chapter presents the summary, findings, conclusions, and recommendations of the study.

4.1 Summary of the Study

Teacher talk is a rich source of comprehensible language input for learners, which is the founding aspect of language acquisition and learning. While most studies conducted about language use in teacher talk were conducted in the context of language learning in face-to-face classes, the present study intended to fill the gap by investigating the language/s use in teacher talk during online synchronous science and mathematics classes.

This descriptive study was an attempt to describe teacher talk as it was used by science and mathematics teachers of the Senior High School in online synchronous classes during the School Year 2020-2021. The participants of the study were three teachers who taught either science or mathematics subjects. Since the study was carried out during the implementation of the Basic Education Learning Continuity Plan, the observed classes were held during online synchronous sessions. The study employed various methods of data collection, namely: naturalistic observation, content analysis, stimulated recall, and semi-structured interview. The recorded data were transcribed, segmented, and analyzed according to the language use, type of teacher talk, and contexts of use.

4.2 Findings of the Study

4.2.1 Language Use in Teacher Talk

The teachers used different languages to varying degrees which can be attributed to their self-perceived proficiency in both Filipino and English or their beliefs about which

language should be used as the primary medium of instruction in their respective academic disciplines.

4.2.2 Types of Teacher Talk

The teachers' talks were either equally composed of instructional and management talks or predominantly instructional talks. This may be attributed to the context of the classes, which were online synchronous sessions. It was observed that in this mode of delivery, there were less student interruptions since most students were initially asked to put their microphones on mute. Management talks were mostly used to check if the teachers' audio was heard in case there were Internet connection problems. Likewise, the teachers confirmed that their classes were mostly directed toward delivering content than facilitating learning activities.

4.2.3 Contexts of Teacher Talk

The teachers used instructional talk mostly to explain the lessons. Other than this, they also used it to acknowledge and remind students. In terms of management talk, the teachers used it mostly to talk/chat with students. Aside from this, they also used it to ask students to do something, encourage, give turn, and instruct.

4.2.4 Language Use in Different Types of Teacher Talk

Teachers used either a mix of Filipino and English or exclusively English for most parts of the talk, regardless of whether the talk was to deliver instruction or to manage the class. It also appears that their choice of language is consistent regardless of the type of teacher they talk to. Likewise, it seems that English with one word or morpheme is the least used type of language in their talks. Data from the interview revealed that teachers often resort to translation in case they think their learners do not understand their

utterances.

4.2.5 Language Use in the Different Contexts of Teacher Talks

In terms of the language used in the different contexts of instructional talk, the teachers' utterances were mostly a mix of Filipino and English, entirely English, or predominantly Filipino with one word or morpheme in English in explaining, reminding, and acknowledging. On the other hand, in terms of management talk, other than Mix and L2, which were used in encouraging and explaining, most teachers used exclusively Filipino and predominantly Filipino with one word or morpheme in English in asking students to do something or talking/chatting with them.

4.2.6 Reasons for Language Alternations in Teacher Talk

While the teacher-participants try their best to use English in most of their utterances, they would occasionally shift to Filipino for some reasons such as considering the learners' ability to comprehend and participate, the enrichment of their lesson content, their pedagogical strategies, and the interaction with and among learners. The teacher-participants mentioned some reasons. Likewise, the teachers' choice of language inside the classroom is influenced by a multitude of factors like their perceived language proficiency, their perceived language ability of the students, their beliefs about the prescribed medium of instruction, their pedagogical training and past classroom experiences, the language of the instructional materials, student engagement, context of the topic, and phase of the lesson.

4.2.7 Inputs to the Multilingual Education Bridging Plan

In terms of L1, bilingual teachers can use it for the reinforcement of important information, instruction, procedures, and directions. Also, L1 can be used to explain local

concepts better. Likewise, the socio-emotional component of the lesson can be delivered or facilitated using the L1 since it is perceived to be more profound and impactful if done in a language which is more familiar to the learner.

In terms of L2, initial presentation and explanation of previous lessons are best done in L2 since resource materials and references are available in L2. Also, class routines can be done in the L2 since these are conventional protocols that are universally understood. Lastly, concluding the lesson is encouraged to be done in L2 to highlight important concepts and aspects of the topic.

4.3 Limitations

1. The study was limited to the science and mathematics teachers of a Senior High School in San Pedro, Laguna, a Tagalog-speaking province. Findings may vary had the study been conducted in places where other local languages are spoken or where there are more than two languages are spoken.
2. The study was conducted during the first year of implementation of the Basic Learning Continuity Plan prompted by the Covid-19 pandemic. In such circumstances, remote teaching-learning was the norm. Results may vary had the observation been done in a face-to-face class.
3. The study focused only on teachers' utterances and did not account for teacher-student interaction.
4. The pedagogical guidelines were solely based on the interviews with teachers and may need to be validated by the learners themselves.

4.4 Conclusions

The following conclusions are drawn from the findings of the study:

1. Bilingual science and mathematics teachers use different languages to varying degrees, which can be attributed to their self-perceived L1 and L2 proficiency, as well as their beliefs about the prescribed medium of instruction of their respective disciplines.
2. Bilingual science and mathematics teachers' talks are either equally composed of instructional and management talks or predominantly instructional talks. This may be attributed to the nature of online synchronous classes, in which there are less student interruptions.
3. Bilingual science and mathematics teachers use either code-switching/mixing or English for most parts of talks, regardless of whether the talk is to deliver instruction or to manage their classes. Their choice of language is consistent regardless of the type of teacher they talk to. Likewise, it seems that L2c is the least used type of language in their talks. Also, they often resort to translation to ensure student comprehension.
4. Bilingual science and mathematics teachers use instructional talk mostly to explain the lessons. Other than this, they also use it to introduce new material, remind, ask for information, and encourage. In terms of management talk, they use it mostly to talk/chat with students. Aside from this, they also use it to encourage instruction, ask students to do something, or give turns to other students.
5. In terms of language use in the different contexts of instructional talk, bilingual science and mathematics teachers' utterances were mostly a mix of Filipino and English (Mix), entirely English (L2), or predominantly Filipino with one word or morpheme in English in explaining, reminding, and acknowledging. On the other

hand, in terms of management talk, other than Mix and L2, which were used in encouraging and explaining, most teachers used L1 and L1c in asking students to do something or talking/chatting with them.

6. Bilingual science and mathematics teachers' choice of language inside the classroom is influenced by a multitude of factors like their perceived language proficiency, their perceived language ability of the students, their beliefs about the prescribed medium of instruction, their pedagogical training and past classroom experiences, the language of the instructional materials, student engagement, context of the topic, and phase of the lesson. Likewise, there are myriad of reasons for their shifts to L1 during the class such as the students, content, instruction, and interaction.
7. In terms of L1, bilingual science and mathematics teachers can use it for the reinforcement of important information, instruction, procedures, and directions. Also, L1 can be used to explain local concepts better. Likewise, the socio-emotional component of the lesson can be delivered or facilitated using the L1 since it is perceived to be more profound and impactful if done in a language which is more familiar to the learner.
8. In terms of L2, initial presentation and explanation of previous lessons are best done in L2 since resource materials and references are available in the L2. Also, class routines can be done in the L2 since these are conventional protocols that are universally understood. Lastly, concluding the lesson is encouraged to be done in L2 to highlight important concepts and aspects of the topic.
9. Language alternation is a common practice among bilingual teachers to respond to

the needs of bilingual learners. It serves as a teaching strategy to facilitate comprehension and maximize learner participation, thus improving the teaching-learning process even in a non-language class.

4.5 Recommendations

Based on the findings and conclusions, the following recommendations are suggested:

1. The learners' L1 should not be considered as a hindrance to learning but a viable means of instructional medium in content classes such as science and mathematics.
2. Since the study was conducted during an online setting, it is recommended that the same should be conducted during face-to-face classes in the hopes that it might yield different findings.
3. Similar studies should be conducted in other contexts such as other academic strands (i.e. accountancy and business management, humanities and social sciences, technical, vocational, and livelihood strands, etc.) or year level (i.e, elementary, junior high school, and tertiary).
4. Since the study was limited to the science and mathematics teachers of a Senior High School, a public senior high school in San Pedro, Laguna, a Tagalog-speaking province, suggested inputs to the existing Multilingual Education Bridging Plan should be validated on Filipino learners to ensure their effectiveness.

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APPENDIX A: CLEARANCE TO PROCEED

 PHILIPPINE NORMAL UNIVERSITY The National Center for Teacher Education Taft Ave. Cor. Ayala Blvd., Ermita, Manila 1000 Philippines Trunkline: +63-2-317-1768 loc 750/751 eprdc@pnu.edu.ph www.pnu.edu.ph	Index No.	PNU-MN-2016-EPR-FM-016
	Issue No.	01
	Rev. No.	01
	Date:	09-24-2018
	Page	1 of 1
EPR	CLEARANCE TO PROCEED	
	QAC No.	CC-09242018-023

BASIC INFORMATION

REC Code:	06012021-141
Research Proposal Title:	Language Choices in Teacher Talk in Online Synchronous STEM Classrooms: A Basis for the Development of Pedagogical Guidelines for STEM Teachers
Researcher / Project Leader and Designation/Affiliation:	Noel Chris P. Manlangit

The following items [v] have been received and reviewed in connection with the above study to be conducted by the above researcher.

- ☒ Research Proposal in prescribed format
- ☒ Informed Consent Form/s /Assent Form
- ☒ Data Collection Tools

and hereby approved:

- ☒ To proceed to the validation of the data gathering tools
- ☒ To proceed to data collection, organization and write-up

Date of Issuance: **June 1, 2021**


Dr. TERESITA T. RUNGDUIN
 Secretary
 Research Ethics Committee


Dr. RENE R. BELECINA
 Chair
 Research Ethics Committee

(All documents without the PNU QM Stamp or Control Identifier are uncontrolled)

APPENDIX B: PERMISSION TO CONDUCT THE STUDY



March 8, 2021

Sir:

Greetings of peace and abundance!

I am a candidate for a degree of Master of Arts in Education and currently working on research entitled **"LANGUAGE CHOICES IN TEACHER TALK IN ONLINE SYNCHRONOUS STEM CLASSROOMS: A BASIS FOR THE DEVELOPMENT OF PEDAGOGICAL GUIDELINES FOR STEM TEACHERS"**. This study is a requirement in partial fulfillment of the course which I am pursuing at **Philippine Normal University-Manila**.

In connection, may I request your permission to allow me to gather data which involve the number of Math and Science Teachers teaching in Pacita Complex Senior High School, District of San Pedro Laguna under your jurisdiction.

Rest assured that the data gathered will be strictly for research purposes only and will be kept with utmost confidentiality.

Thank you and God bless!

Very respectfully,

NOEL CHRIS P. MANLANGIT
Researcher

Noted:

DR. FLORENCIA F. MARQUEZ
Thesis Adviser

Approved:

JOVITO M. BARCENAS, PhD
Public Schools District Supervisor
District of San Pedro

APPENDIX C: INFORMED CONSENT (Page 1 of 2)



INFORMED CONSENT

My name is **Noel Chris P. Manlangit**, a graduate student studying Master of Arts in Education with specialization in Bilingual Education. I am currently writing my master's thesis which aims to investigate the language choices in teacher talk in synchronous science and mathematics classes. With this, I would like to inform you that you have been purposively selected for the study on the basis that you are one science faculty members of Pacita Complex Senior High School. Please carefully read the terms and conditions of participating in the study before signing.

This study is being conducted to complete my final requirement for the graduate degree I am pursuing. Its objective is to identify what language/s science and mathematics teachers use in conducting and managing their classes as well as how they use them. This is in hope that the findings can add relevant literature in the subject of language in instruction and teaching practice.

In total, there will be three participants in the study, two are science teachers and one mathematics teacher deployed at Pacita Complex Senior High School. As one of the participants in the study, you will be asked to partake in the following:

Video-recorded observations (one hour each, three hours in total for the duration of the study)

One-on-one interview (one hour each, three hours in total for the duration of the study)

Group interview (two hours)

These are the risks and inconveniences that you might encounter during the study's conduct such as:

You may feel uncomfortable being observed while you hold classes; and you may have to set an extra time for the interviews following the observation sessions as well as the group discussion.

To address such risks and inconvenience, the following measures will be observed:

For your comfort and convenience, you will be allowed to choose the date and time of the observation; and you will be notified about your scheduled observation two days prior to give you time to prepare yourself both physically and psychologically for the observation.

Results will only be shared in aggregate form. The research data will be stored digitally in a password-protected computer. The data will be erased in three years after the completion of the study. However, due to the focus group discussion, complete confidentiality cannot be guaranteed. Last, in the event that the results of the study will be used on reports, presentations, and publications, your name will not be used.

APPENDIX C: INFORMED CONSENT (Page 2 of 2)

This study is entirely voluntary. They may choose not to take part in it, or may leave any time and will not be subject to any penalty or affect your current or future relations with any person in your place of employment.

The results and findings of the study will contribute to field of knowledge in teaching. It may be instrumental in solving current problems regarding the language in instruction.

Although the study shall not have a direct benefit as to your career, you will be given a simple token of appreciation for participating in the study. It will be given to you after the completion of the data gathering.

If you have any questions about the study, please feel free to contact me at 09218979735 or email me at noelchris.manlangit001@deped.gov.ph Or you may also contact my thesis adviser Dr. Florencia Marquez at 09498440110. If you have questions about your rights as a participant in this research or if you feel you have been placed at risk, you can contact the Research Ethics Committee Office at belecina.rr@pnu.edu.ph or (02)8750-4029.

By signing below, you are giving consent to participate in the study. Please check the option that applies to you before signing.

- () I give my permission for my teaching performance to be audio/video recorded.
() I do not give my permission for my teaching performance to be audio/video recorded.

Name of the Participant: _____

Signature of the Participant: _____

Date: _____

APPENDIX D: INSTRUMENT VALIDATION (EXPERT 1)

Greetings of peace and love!

I, Noel Chris P. Manlangit, a graduate student of Philippine Normal University, am undertaking a research entitled "**LANGUAGE CHOICES IN TEACHER TALK IN SYNCHRONOUS ONLINE STEM CLASSROOMS: A BASIS FOR THE DEVELOPMENT OF PEDAGOGICAL GUIDELINES FOR BILINGUAL STEM TEACHERS**" as a requirement for the completion of my master's degree in Bilingual Education. The purpose of this research is to find out the use of teacher talk as it is used by STEM teachers, describe the language choice in teacher talk, and explore the reasons for the language choices.

With your expertise, I am humbly asking your permission serve as a validator for the attached document containing the questions for the focused-group discussion.

I am looking forward that our request would merit your positive response.

Yours truly,



NOEL CHRIS P. MANLANGIT
Researcher

Noted by:



FLORANCIA F. MARQUEZ, Ph. D.
Research Adviser

APPENDIX D: INSTRUMENT VALIDATION (EXPERT 1)

Questions for Focused-Group Discussion	Remarks		
	Accepted	Rejected	Comments
1. How do you describe yourself as a speaker of Filipino/Tagalog?	✓		
a. How do you evaluate your Filipino language proficiency?	✓		
2. How do you describe yourself as a speaker of English?	✓		
a. How would you evaluate your English language proficiency?	✓		
b. How do describe your experience learning the English language?	✓		
3. Can you please describe the language/s you use in the classroom?	✓		
a. What language do you use in teaching your students?	✓		
b. What language do you use when you manage the classroom?	✓		
4. What is your opinion about the use of Filipino/Tagalog inside your classroom?	✓		
a. How do your students as a speaker of Filipino/Tagalog?	✓		
5. What is your opinion about the use English inside the classroom?	✓		
a. How do your students as a speaker of English?	✓		
6. In your opinion, what language/s should teachers use in teaching?	✓		
7. In your opinion, how should STEM teachers use both English and Filipino in the classroom?	✓		
8. How can we integrate language learning in STEM Classrooms?	✓		
General Comment(s): Ask participants to specify parts of the lesson in which they have to shift from L2 to L1 and vice versa and note their reasons.			

APPENDIX D: INSTRUMENT VALIDATION (EXPERT 1)

Certificate of Validation

This is to certify that the questions for the focused-group discussion of the study entitled “LANGUAGE CHOICES IN TEACHER TALK IN SYNCHRONOUS ONLINE STEM CLASSROOMS: A BASIS FOR THE DEVELOPMENT OF PEDAGOGICAL GUIDELINES FOR BILINGUAL STEM TEACHERS” was validated by the undersigned as to its composition, grammar, and biases.

The review was limited to editing for the purpose of validity and reliability of the research instruments.

Validated by:

APPENDIX D: INSTRUMENT VALIDATION (EXPERT 2)

Greetings of peace and love!

I, Noel Chris P. Manlangit, a graduate student of Philippine Normal University, am undertaking a research entitled "**LANGUAGE CHOICES IN TEACHER TALK IN SYNCHRONOUS ONLINE STEM CLASSROOMS: A BASIS FOR THE DEVELOPMENT OF PEDAGOGICAL GUIDELINES FOR BILINGUAL STEM TEACHERS**" as a requirement for the completion of my master's degree in Bilingual Education. The purpose of this research is to find out the use of teacher talk as it is used by STEM teachers, describe the language choice in teacher talk, and explore the reasons for the language choices.

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Yours truly,



NOEL CHRIS P. MANLANGIT
Researcher

Noted by:



FLORINDA F. MARQUEZ, Ph. D.
Research Adviser

APPENDIX D: INSTRUMENT VALIDATION (EXPERT 2)

Questions for Focused-Group Discussion	Remarks		
	Accepted	Rejected	Comments
1. How do you describe yourself as a speaker of Filipino/Tagalog?	/		
a. How do you evaluate your Filipino language proficiency?	/		
2. How do you describe yourself as a speaker of English?	/		
a. How would you evaluate your English language proficiency?	/		
b. How do describe your experience learning the English language?	/		
3. Can you please describe the language/s you use in the classroom?	/		
a. What language do you use in teaching your students?	/		
b. What language do you use when you manage the classroom?	/		
4. What is your opinion about the use of Filipino/Tagalog inside your classroom?	/		
a. How do your students as a speaker of Filipino/Tagalog?	/		
5. What is your opinion about the use English inside the classroom?	/		
a. How do your students as a speaker of English?	/		
6. In your opinion, what language/s should teachers use in teaching?	/		
7. In your opinion, how should STEM teachers use both English and Filipino in the classroom?	/		
8. How can we integrate language learning in STEM Classrooms?	/		
General Comment(s): Allow participants to preview the questions before starting the group interview.			

Validated by:

APPENDIX D: INSTRUMENT VALIDATION (EXPERT 2)

Certificate of Validation

This is to certify that the questions for the focused-group discussion of the study entitled “LANGUAGE CHOICES IN TEACHER TALK IN SYNCHRONOUS ONLINE STEM CLASSROOMS: A BASIS FOR THE DEVELOPMENT OF PEDAGOGICAL GUIDELINES FOR BILINGUAL STEM TEACHERS” was validated by the undersigned as to its composition, grammar, and biases.

The review was limited to editing for the purpose of validity and reliability of the research instruments.

Validated by:

APPENDIX D: INSTRUMENT VALIDATION (EXPERT 3)

Greetings of peace and love!

I, Noel Chris P. Manlangit, a graduate student of Philippine Normal University, am undertaking a research entitled "**LANGUAGE CHOICES IN TEACHER TALK IN SYNCHRONOUS ONLINE STEM CLASSROOMS: A BASIS FOR THE DEVELOPMENT OF PEDAGOGICAL GUIDELINES FOR BILINGUAL STEM TEACHERS**" as a requirement for the completion of my master's degree in Bilingual Education. The purpose of this research is to find out the use of teacher talk as it is used by STEM teachers, describe the language choice in teacher talk, and explore the reasons for the language choices.

With your expertise, I am humbly asking your permission serve as a validator for the attached document containing the questions for the focused-group discussion.

I am looking forward that our request would merit your positive response.

Yours truly,



NOEL CHRIS P. MANLANGIT
Researcher

Noted by:



FLORANCIA F. MARQUEZ, Ph. D.
Research Adviser

APPENDIX D: INSTRUMENT VALIDATION (EXPERT 3)

Questions for Focused-Group Discussion	Remarks		
	Accepted	Rejected	Comments
1. How do you describe yourself as a speaker of Filipino/Tagalog?	✓		
a. How do you evaluate your Filipino language proficiency?	✓		
2. How do you describe yourself as a speaker of English?	✓		
a. How would you evaluate your English language proficiency?	✓		
b. How do describe your experience learning the English language?	✓		
3. Can you please describe the language/s you use in the classroom?	✓		
a. What language do you use in teaching your students?	✓		
b. What language do you use when you manage the classroom?	✓		
4. What is your opinion about the use of Filipino/Tagalog inside your classroom?	✓		
a. How do your students as a speaker of Filipino/Tagalog?	✓		
5. What is your opinion about the use English inside the classroom?	✓		
a. How do your students as a speaker of English?	✓		
6. In your opinion, what language/s should teachers use in teaching?	✓		
7. In your opinion, how should STEM teachers use both English and Filipino in the classroom?	✓		
8. How can we integrate language learning in STEM Classrooms?	✓		

APPENDIX D: INSTRUMENT VALIDATION (EXPERT 3)

Certificate of Validation

This is to certify that the questions for the focused-group discussion of the study entitled “LANGUAGE CHOICES IN TEACHER TALK IN SYNCHRONOUS ONLINE STEM CLASSROOMS: A BASIS FOR THE DEVELOPMENT OF PEDAGOGICAL GUIDELINES FOR BILINGUAL STEM TEACHERS” was validated by the undersigned as to its composition, grammar, and biases.

The review was limited to editing for the purpose of validity and reliability of the research instruments.

Validated by:

APPENDIX E: RESEARCH INSTRUMENT



Date:	Time:
Length of Activity:	Site:
Participants:	
I. Profile of the Participants: a. Educational Attainment b. Years in teaching c. Taught subject d. Position II. Questions for group 1. How do you describe yourself as a speaker of Filipino/Tagalog? a. How you do evaluate your Filipino language proficiency? 2. How do you describe yourself as a speaker of English? a. How would you evaluate your English language proficiency? b. How do describe your experience learning the English language? 3. Can you please describe the language/s you use in the classroom? a. What language do you use in teaching your students? b. What language do you use when you manage the classroom? 4. What is your opinion about the use of Filipino/Tagalog inside your classroom? a. How do your students as a speaker of Filipino/Tagalog? 5. What is your opinion about the use English inside the classroom? a. How do your students as a speaker of English?	

APPENDIX E: RESEARCH INSTRUMENT

6. In your opinion, what language/s should teachers use in teaching?
7. In your opinion, how should STEM teachers use both English and Filipino in the classroom?
8. How can we integrate language learning in STEM Classrooms?

WPS Office for Mac
<https://www.wps.com/mac/>

APPENDIX F: SAMPLE TRANSCRIPTIONS OF CLASS OBSERVATIONS

Total Video Time: 32:55 Total Speech Time: 31:30:12

Underlined = read on slides

1. Good morning class | L2 | MANAGEMENT | (Greeting)
 2. Okay, good morning | L2 | MANAGEMENT | (Greeting)
 3. so Sir Noel will attend our class today kagaya last time | CODE-SWITCHING |
MANAGEMENT | (Talking/ Chatting to students)
 4. Okay, good morning, Sir Noel | L2 | MANAGEMENT | (Greeting)
 5. Okay, paki-turn on ang mga Camera po bago tayo mag start | CODE-SWITCHING |
MANAGEMENT | (Asking to do something)
 6. Ayan, Nakikita na yung Poverpoint? | L2 | MANAGEMENT | (Talk/ Chatting to
Students)
 7. Sige, Okay, wait lang ha? | CODE-SWITCHING | MANAGEMENT | (Talk/ Chatting
to Students)
 8. Nasa school kasi ako | L1c | MANAGEMENT | (Talk/ Chatting to Students)
 9. Okay, let's start | L2 | INSTRUCTIONAL | (Introduction)
 10. So our topic for today is about Testing Hypothesis | L2 | INSTRUCTIONAL |
(Introduction)
 11. Ayan so, Decision Making | CODE-SWITCHING | INSTRUCTIONAL |
(Introduction)
- Reads slide

Expectation

Total Video Time: 1 hour, 5 minutes and 11 seconds

Total Speech Time: 53 minutes and 51 seconds

Transcription:

1. To the monitors of our attendance today | again, I remind you to check the attendance (turn on) at least 15
minutes before our (turn on) the end of the session. | L2 | MANAGEMENT | CHECKING ATTENDANCE
2. Kindly take the screenshot :: of whoever are present in today's session :: because (turn on) its hard to see
whoever are not present during the entire session. | L2 | MANAGEMENT | ASKING TO DO SOMETHING
3. Okay | L2 | MANAGEMENT | MARKER
4. To the assigned monitors, please monitor the attendance | L2 | MANAGEMENT | ASKING TO DO
SOMETHING
5. Kindly check it :: by using the tool that you have | L2 | MANAGEMENT | INSTRUCTION
6. Kindly check 15 minutes before the end of the session | L2 | MANAGEMENT | INSTRUCTION
7. Okie, so I am expecting (again) we are expecting (turn on) how many students | L2 | MANAGEMENT |
ASKING INFORMATION
8. No 61 students to be present today | L2 | MANAGEMENT | CHECKING ATTENDANCE
9. This is the combined attendance of the Archimedes and Bernoulli | L2 | MANAGEMENT | (talk/ chatting
with the students)
10. So I'm expecting at least (turn) 75 percent :: for those who are not able to make it today | L2 |
MANAGEMENT | (Checking Attendance)
11. Last time munat tayo seven absences, alright? | CODE-SWITCHING | MANAGEMENT |
CHECKING ATTENDANCE
12. By the way, who has turned in their assignment for the concept about evolution (ah) theory? | L2 |
MANAGEMENT | ASKING FOR INFORMATION

Total Speech Time: 1 hour, 38 minutes, and 45 seconds

Total Video Time: 2 hours, 18 minutes, and 24 seconds

1. | Okay. Once again, good morning to everyone. | L2 | MANAGERIAL | GREETING
2. | Let us now continue our discussion. | L2 | MANAGERIAL | TALK/ CHATTING TO
STUDENTS
3. | [We] are now in the Week 3. | L2 | MANAGERIAL | TALK/ CHATTING TO STUDENTS
4. | So this is already an introduction to the part 2 of our Calculus and that is all under Anti
or Differential Antiderivatives Integral Calculus. | L2 | MANAGERIAL | TALK/ CHATTING
TO STUDENTS
5. | Now, nasa part 2 na tayo ng ating Calculus. | CODE-SWITCHING | MANAGERIAL |
TALK/ CHATTING TO STUDENTS
6. | and that is Integral Calculus | L2 | MANAGERIAL | TALK/ CHATTING TO STUDENTS
7. | and under Integral Calculus, we are now talking about Antiderivative of a Function. | L2
| MANAGERIAL | TALK/ CHATTING TO STUDENTS
8. | [So for the introduction] For today, [at] the end of our session, we'll be able to Ano ba
tong tinatawag na Antiderivatives? Kasi pagdating sa Differential Calculus, we are
referring to derivative. | CODE-SWITCHING | INSTRUCTIONAL | INTRODUCTION | OK
9. | We are differentiating, but then in : the... part 2 of Integral Calculus, so it's Antiderivative
| L2 | INSTRUCTIONAL | INTRODUCTION | OK
10. | So may nakakabit na anti | L1c | INSTRUCTIONAL | EXPLANATION | OK
11. | So pag Differential, we are only determining the derivative of the function or
differentiating a given function. | L2 | INSTRUCTIONAL | EXPLANATION | OK

APPENDIX G: LANGUAGE USE IN THE DIFFERENT CONTEXTS OF INSTRUCTIONAL TALK

Context of Instructional Talk	Teacher 1										Teacher 2										Teacher 3									
	L1		L1c		Mix		L2		L2c		L1		L1c		Mix		L2		L2c		L1		L1c		Mix		L2		L2c	
	f	%	f	%	f	%	f	%	f	%	f	%	f	%	f	%	f	%	f	%	f	%	f	%	f	%	f	%	f	%
Acknowledging	0	0.00	0	0.00	0	0.00	0	0.00	0	0.00	0	0.00	0	0.00	0	0.00	3	0.92	0	0.00	5	0.48	0	0.00	4	0.38	64	6.15	1	0.10
Asking for information	0	0.00	0	0.00	0	0.00	0	0.00	0	0.00	0	0.00	1	0.31	7	2.15	13	3.99	0	0.00	6	0.58	2	0.19	19	1.83	36	3.46	3	0.29
Asking to do something	0	0.00	0	0.00	1	1.00	0	0.00	0	0.00	0	0.00	0	0.00	0	0.00	3	0.92	0	0.00	0	0.00	0	0.00	2	0.19	6	0.58	0	0.00
Attracting attention	0	0.00	0	0.00	0	0.00	0	0.00	0	0.00	0	0.00	0	0.00	0	0.00	3	0.92	0	0.00	0	0.00	0	0.00	4	0.38	2	0.19	0	0.00
Changing topics	0	0.00	0	0.00	2	2.00	3	3.00	1	1.00	0	0.00	1	0.31	3	0.92	7	2.15	0	0.00	0	0.00	0	0.00	16	1.54	25	2.40	2	0.19
Checking for comprehension	0	0.00	1	1.00	0	0.00	0	0.00	0	0.00	2	0.61	1	0.31	5	1.53	9	2.76	0	0.00	0	0.00	0	0.00	1	0.10	1	0.10	2	0.19
Commenting	1	1.00	0	0.00	0	0.00	0	0.00	0	0.00	0	0.00	0	0.00	0	0.00	0	0.00	0	0.00	7	0.67	2	0.19	3	0.29	2	0.19	0	0.00
Consolidating	0	0.00	0	0.00	1	1.00	1	1.00	0	0.00	0	0.00	0	0.00	3	0.92	1	0.31	0	0.00	0	0.00	1	0.10	3	0.29	17	1.63	0	0.00
Correcting	0	0.00	0	0.00	0	0.00	0	0.00	0	0.00	1	0.31	0	0.00	1	0.31	0	0.00	0	0.00	0	0.00	1	0.10	1	0.10	2	0.19	1	0.10
Dictating	0	0.00	0	0.00	0	0.00	0	0.00	0	0.00	0	0.00	0	0.00	0	0.00	0	0.00	0	0.00	0	0.00	0	0.00	0	0.00	1	0.10	0	0.00
Encouraging	0	0.00	0	0.00	0	0.00	0	0.00	0	0.00	1	0.31	0	0.00	2	0.61	6	1.84	0	0.00	5	0.48	2	0.19	5	0.48	53	5.10	3	0.29
Explanation	0	0.00	0	0.00	41	41.00	9	9.00	0	0.00	13	3.99	19	5.83	61	18.71	90	27.61	4	1.23	30	2.88	40	3.85	242	23.27	210	20.19	19	1.83
Giving direction	0	0.00	0	0.00	1	1.00	0	0.00	0	0.00	0	0.00	0	0.00	1	0.31	0	0.00	0	0.00	1	0.10	0	0.00	6	0.58	22	2.12	0	0.00
Giving examples	1	1.00	1	1.00	2	2.00	6	6.00	0	0.00	1	0.31	0	0.00	1	0.31	10	3.07	0	0.00	0	0.00	0	0.00	6	0.58	6	0.58	1	0.10
Giving suggestion	0	0.00	0	0.00	0	0.00	0	0.00	0	0.00	0	0.00	1	0.31	0	0.00	1	0.31	0	0.00	0	0.00	1	0.10	3	0.29	0	0.00	0	0.00
Interpreting	0	0.00	0	0.00	0	0.00	0	0.00	0	0.00	0	0.00	0	0.00	1	0.31	0	0.00	0	0.00	1	0.10	0	0.00	0	0.00	0	0.00	0	0.00
Interrupting	0	0.00	0	0.00	0	0.00	0	0.00	0	0.00	0	0.00	0	0.00	0	0.00	0	0.00	0	0.00	0	0.00	0	0.00	0	0.00	1	0.10	0	0.00
Introducing material	1	1.00	4	4.00	5	5.00	3	3.00	0	0.00	0	0.00	3	0.92	3	0.92	10	3.07	0	0.00	1	0.10	3	0.29	6	0.58	21	2.02	2	0.19
Introduction	0	0.00	0	0.00	1	1.00	2	2.00	0	0.00	0	0.00	0	0.00	0	0.00	1	0.31	0	0.00	0	0.00	0	0.00	0	0.00	5	0.48	0	0.00
Reminding	0	0.00	0	0.00	11	11.00	1	1.00	0	0.00	1	0.31	0	0.00	10	3.07	16	4.91	0	0.00	2	0.19	6	0.58	41	3.94	28	2.69	1	0.10
Repeating	0	0.00	0	0.00	0	0.00	0	0.00	0	0.00	1	0.31	1	0.31	1	0.31	3	0.92	0	0.00	1	0.10	1	0.10	3	0.29	19	1.83	1	0.10

APPENDIX H: LANGUAGE USE IN THE DIFFERENT CONTEXTS OF MANAGEMENT TALK

Context of Management Talk	Teacher 1										Teacher 2										Teacher 3									
	L1		L1c		Mix		L2		L2c		L1		L1c		Mix		L2		L2c		L1		L1c		Mix		L2		L2c	
	f	%	f	%	f	%	f	%	f	%	f	%	f	%	f	%	f	%	f	%	f	%	f	%	f	%	f	%	f	%
Acknowledging	0	0.00	3	3.00	1	1.00	0	0.00	0	0.00	2	1.15	2	1.15	1	0.57	7	4.02	0	0.00	1	7.14	0	0.00	0	0.00	1	3.57	0	0.00
Advising	0	0.00	0	0.00	0	0.00	0	0.00	0	0.00	0	0.00	1	0.57	1	0.57	3	1.72	0	0.00	0	0.00	0	0.00	0	0.00	0	0.00	0	0.00
Apologizing	0	0.00	0	0.00	0	0.00	0	0.00	0	0.00	0	0.00	0	0.00	0	0.00	0	0.00	0	0.00	0	0.00	0	0.00	1	5.56	0	0.00	0	0.00
Asking for information	3	3.00	0	0.00	0	0.00	1	1.00	0	0.00	0	0.00	2	1.15	0	0.00	8	4.60	0	0.00	1	7.14	0	0.00	3	16.67	3	10.71	0	0.00
Asking to do something	1	1.00	11	11.00	6	6.00	2	2.00	0	0.00	1	0.57	0	0.00	1	0.57	19	10.92	0	0.00	0	0.00	0	0.00	2	11.11	0	0.00	0	0.00
Checking attendance	0	0.00	0	0.00	0	0.00	0	0.00	0	0.00	0	0.00	1	0.57	1	0.57	3	1.72	0	0.00	1	7.14	0	0.00	0	0.00	0	0.00	0	0.00
Encouraging	6	6.00	0	0.00	2	2.00	6	6.00	0	0.00	8	4.60	7	4.02	4	2.30	34	19.54	0	0.00	5	35.71	2	20.00	2	11.11	0	0.00	0	0.00
Ending lesson/topic	0	0.00	0	0.00	1	1.00	0	0.00	0	0.00	0	0.00	0	0.00	0	0.00	1	0.57	0	0.00	0	0.00	0	0.00	1	5.56	1	3.57	0	0.00
Giving turn	0	0.00	0	0.00	0	0.00	1	1.00	0	0.00	0	0.00	0	0.00	0	0.00	0	0.00	0	0.00	1	7.14	1	10.00	0	0.00	10	35.71	0	0.00
Greeting	0	0.00	0	0.00	0	0.00	3	3.00	0	0.00	0	0.00	0	0.00	0	0.00	3	1.72	0	0.00	0	0.00	0	0.00	0	0.00	1	3.57	0	0.00
Instruction	0	0.00	0	0.00	14	14.00	5	5.00	1	1.00	1	0.57	0	0.00	3	1.72	6	3.45	0	0.00	1	7.14	2	20.00	1	5.56	3	10.71	0	0.00
Marker	0	0.00	0	0.00	0	0.00	1	1.00	0	0.00	0	0.00	0	0.00	0	0.00	3	1.72	0	0.00	0	0.00	0	0.00	1	5.56	1	3.57	0	0.00
Talking/chatting to students	10	10.00	11	11.00	5	5.00	1	1.00	2	2.00	9	5.17	3	1.72	13	7.47	18	10.34	2	1.15	4	28.57	5	50.00	7	38.89	6	21.43	0	0.00
Thanking	1	1.00	0	0.00	0	0.00	1	1.00	1	1.00	0	0.00	0	0.00	2	1.15	4	2.30	0	0.00	0	0.00	0	0.00	0	0.00	2	7.14	0	0.00

APPENDIX I CERTIFICATE OF LANGUAGE EDITING

Philippine Normal University
The National Center for Teacher Education
College of Graduate Studies and Teacher Education Research
Taft Avenue, Manila

5 April 2022

C E R T I F I C A T I O N

This certifies that I have language edited the thesis titled “AN ANALYSIS OF LANGUAGE ALTERNATION IN TEACHER TALK AMONG BILINGUAL SCIENCE AND MATHEMATICS TEACHERS: INPUTS TO THE MULTILINGUAL EDUCATION BRIDGING PLAN”, by NOEL CHRIS P. MANLANGIT, a candidate for the degree MASTER OF ARTS IN EDUCATION with specialization in Bilingual Education.

GRAMMARIAN CERTIFICATION

This is to certify that the Thesis manuscript, with a title, *"AN ANALYSIS OF LANGUAGE ALTERNATION IN TEACHER TALK AMONG BILINGUAL SCIENCE AND MATHEMATICS TEACHERS: INPUTS TO THE MULTILINGUAL EDUCATION BRIDGING PLAN"*, prepared by **Mr. Noel Chris P. Manlangit** has been edited and found to be complete and satisfactory with respect to grammar and composition by the undersigned.

PROOF READING AND ORIGINALITY CERTIFICATION

This is to certify that the Thesis manuscript, with a title, *"AN ANALYSIS OF LANGUAGE ALTERNATION IN TEACHER TALK AMONG BILINGUAL SCIENCE AND MATHEMATICS TEACHERS: INPUTS TO THE MULTILINGUAL EDUCATION BRIDGING PLAN"* prepared by **Ms. Nessa Valencia Catostos** has been edited and found to be original and satisfactory with respect to plagiarism checking and verification by the undersigned.

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Bachelor's Degree	<i>Polytechnic University of the Philippines–San Pedro</i>	2011
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