Students' Language Preference in Learning Science and the Language Environment at School and Home: A Case of Primary Students in the Bicol Region, Philippines

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Abstract

The Philippines' linguistic diversity poses a constant challenge in education. At the primary level, there exists a never-ending argument over which language should be used in educating Filipino students particularly in science and mathematics education, which are mainly taught in English. Past and recent studies in some regions indicated that primary students perform better when using their first language.

The study aimed to know the students' language preference, their extent of use of the local, the national and academic languages in learning science concepts.

The study was conducted in the Region 5 or the Bicol region. It involved Grades 3 and 4 elementary Bicol-speaking Filipino students from one of the six provinces of the said region. To achieve the objectives, the researcher developed and incorporated the use of survey questionnaires which were translated into the Filipino language to determine the students' language preference in learning science concepts. Each item in the survey questionnaire solicited responses about the students' use of the local and academic languages in science learning.

The findings show that most students use their mother language, Bicol, in and outside their homes, and use the Filipino and English languages at school. The results also indicate that the respondents prefer using the Filipino language in science classes particularly in exams, homework, class recitations and in following their teacher's instructions during science class activities.

1. Introduction

The aim of science education in the Philippines is to develop scientific literacy among primary students that will prepare them to be informed and participative citizens who are able to make judgments and decisions regarding applications of scientific knowledge that may have social, health or environmental impacts (K to 12 Curriculum Guide Science).

However, challenges await ahead of the implementation and realization of these science education goals. One of these obstacles is the language diversity in the country. The Philippines is an archipelago of 7,107 islands, divided into 17 multicultural regions where each region has its own distinct language. The country has at least 170 recognized languages. Of these languages, 8 are major languages, 2 are official languages and one national language. Because of the language diversity,

language policies were implemented (Espiritu, 2002). Nevertheless, the existence and implementation of the language policies in education did not stop the never-ending dispute over which language should be used in educating Filipino students. Educators and policy-makers have been divided in which language is most appropriate in teaching the subjects, such as science and mathematics.

Policy makers and educators who support the use of the Filipino language in education reasoned that since it is the national language, it can be effective as a medium of instruction in science. The proponents of teaching science in English claim that the language is tested and feasible, economical and universal in science education. On the other hand, some educators and curriculum developers argue that the vernacular of students should be used as medium of instruction since students learn quickly using it, whereas English and Filipino are considered foreign language and second language in other provinces of the Philippines. The differences of opinion in the medium of instruction in science education is due to the low performance of Filipino students in the national achievement tests in science and in TIMSS, which may indicate their comprehension in science.

English is the medium of instruction in science education at the primary and secondary levels. However, Filipino students still perform poorly in both the National Achievement Test (NAT SY 2010-2011 and SY 2011-2012) and Trends in International Mathematics and Science Study (TIMSS 1999 and 2003).

In the 2010-2011 NAT, grade 3 Filipino students from public schools obtained a mean percentage score of 53.48 in science. The following year, the mean percentage score in science achieved by the grade 3 students was 55.15.

In the 1999 TIMSS, the Philippines ranked 36thoverall out of 38 countries, attaining an average score of 345 compared to the international average of 488 while at the 2003 TIMSS for 4th graders, the Philippines scored an average of 332 compared to the international average of 489 and ranking at 23rd out of the 25 participating countries.

The National Achievement Test results (NAT SY 2010-2011 and SY 2011-2012) and the performance of the students in Trends in International Mathematics and Science Study (TIMSS 1999 and 2003) could indicate that the reason for the students' difficulty in comprehending science concepts is the usage of a language that is not their daily means of communication. Brock-Utne, (2001) stated that students learn to read more quickly when the mother tongue is used as medium of instruction. Furthermore, Nolasco (2009), Benson (2004) and Sibayan (1994) have pointed out that mother tongue helps students understand concepts easily and it enables them to be more critical and rational thinkers. The mother language is also best used as a bridge in learning main languages of instruction (Sibayan, 1994).

Researches done in other regions such as the Iloilo Experiment in 1953 (Orata, 1953), the Lubuagan Experiment in 2003 (Dekker and Dumatog, 2003) and the Leyte Normal University-Integrated Laboratory School Experiment in which the Waray language was used in teaching geometrical figures (Oyzon et al, 2012) indicate high performance of students using their mother language. Because of these experiments and other initiatives, the Department of Education (DepEd), issued the DepEd Order No. 74 and the 2012 DepEd Order No. 16s institutionalizing the use of mother language in primary education as part of the K to 12 Basic Education Program.

The current study focused in Region 5 in which Bicol, one of the 8 major languages in the Philippines, is the mother tongue. There are 4 major Bicol languages spoken in 6 provinces. Of these there are at least 11 dialects. The province of Catanduanes, where the study was conducted, has two major languages, the Northern Catanduanes Bicol and the Southern Catanduanes Bicol. In the region, there are not enough studies conducted on what language primary students can comprehend well and what language they prefer in studying science. In this regard, a research was conducted in 2009 in one of the provinces of the region (Vela, 2010). Through comprehension tests, the aim of the study was to identify in which language from among the 3 languages (English, Filipino and Bicol) students comprehend best. The results of the tests indicated that the primary student respondents comprehend best in the Filipino language.

Accordingly, this research was conducted to obtain further information on the students' language preference as well as their extent of use of the local and academic languages in learning science concepts.

2. Statement of the Problem

This study sought to answer the following questions:

1. What are the primary school students' language preference in science activities and in learning science concepts?
2. To what extent do students use English, Filipino and Bicol?

3. Significance of the Study

This research is important for the following reasons. First, it could provide guidelines in planning and designing pedagogical materials in the language that primary school students prefer and understand in learning practical science concepts. Second, it could present valuable inputs on teaching and learning methods using students' preferred language in teaching and learning science.

4. Objectives and Delimitation of the Study

To have a broad knowledge on the appropriate medium of instruction in science education in the local areas of the Philippines, this study investigated the students' language preference as well as their extent of use of the local and academic languages in learning science concepts.

The study was conducted to grade three and four primary students which focused on determining the language in which they comprehend best in learning science concepts. Survey questionnaires were used to solicit responses on students' language preference in learning science in and outside the school.

The venue of the study was Catanduanes, an island province in the Bicol region. It was chosen due to its accessibility and familiarity with the researcher. Development of the survey questionnaire was done by the researcher in consultation with Filipino teachers and college professors.

5. Methodology

The study was conducted between December 2011 and March 2012 in four public schools located in the northern and southern parts of the province of Catanduanes, one of the six provinces of the Bicol region. The schools follow the regular public elementary education program implemented by the Department of Education.

5.1 Participants

The participants of the study were 318 grade three and 303 grade four students. Each grade level has three sections. Students are usually assigned to a section based on their performance in the class. Those who perform well are sent to the first section. On the other hand, students whose performance is average are assigned to the second or middle sections; while those who perform below average belong to the third or the lowest section possible.

5.2 Research Instruments

The study primarily used a 19-item multiple choice questionnaire to obtain information on students' language preference in the classroom and in learning science concepts.

The questionnaires were written in Filipino. Prior to answering the questionnaires, the researcher with the help of the teachers explained to the students each item and procedures for answering to ensure clarity.

The questionnaire consisted of two parts. The first part was about the student respondents' background information (i.e. name, age, gender and parents' job). The second part contained the main questions focusing on the respondents' use of the three languages (Filipino, Bicol and English) at home, outside their home, at school and inside the classroom. Subsequent questions referred to the language their teachers use while teaching science and the language the student respondents prefer using during class activities. The concluding part of the set of questions adhered to the respondents' language preference in studying science.

6. Findings

Grade 3 Students

Table 1. Socio-demographic characteristics of the Grade Three Students

Age	Number of Students		Total	
	Male	Female		
8	22	23	45	14.2%
9	104	112	216	67.9%
10	25	18	43	13.5%
11	3	5	8	2.5%
12	3	2	5	1.6%
13	1	0	1	0.3%
Total	**160 (50.3%)**	**158 (49.7 %)**	**318**	**100%**

Of the 318 grade 3 student respondents who participated in the research, 160 (50.3%) were female while 158 (49.7%) were male. The age of the respondents ranged between 8 and 13 years old. 9 year old students had the largest population among the student respondents.

Fourteen students with ages ranging between 11 and 13 years old were "repeater" students. According to their teachers, these students were not able to finish the grade 3 level because of various reasons, most notable was that they had to stop going to school because they needed to help their parents earn money for their family's needs.

Table 2. Grade 3 students' understanding of the language

Items	***N*=318**	**%**
Bicol language		
Yes	271	85.2%
A little bit	47	14.8%
Filipino Language		
Yes	284	89.3%
A little bit	27	8.5%
No	7	2.2%

Table 2 presents the language students can understand. Results from the survey show that majority of the respondents confirmed they understand the Bicol language, while 47 (14.8%) slightly understand it, which could indicate that their family migrated from provinces in other regions. 284 (89.3%) students understand Filipino, on the other hand, 27 (8.5%) slightly understand it. Only 7 (2.2%) among the students do not understand the language.

Table 3. Grade 3 students' extent of use of the languages in and outside their home.

	***N*=318**	%
Language that the students use at home		
Bicol language	244	76.7%
Filipino language	63	19.8%
English language	11	3.5%
Language that students use outside their home		
Bicol language	235	73.9%
Filipino language	80	25.2%
English language	3	0.9%
Language that students use when talking to friends		
Bicol language	212	66.7%
Filipino language	101	31.8%
English language	5	1.6%

Table 3 shows that the majority of the students use the Bicol language at home when having daily conversations with their parents, siblings and other family members. Outside their home, more than half of the respondents use the Bicol language while talking and playing with friends and neighbors, and in public places such as markets, churches and parks.

Table 4. Language used in the classroom

	***N*=318**	**%**
Language that the students use inside the classroom when conversing with classmates and teachers		
Filipino language	131	41.2%
Bicol language	117	36.8%
English language	69	21.7%
Language that students use during science class		
English language	267	84%
Filipino language	27	8.5%
Bicol language	24	7.5%

Language teachers use when teaching science		
English and Filipino language	125	39.3 %
English	102	32.1 %
English, Filipino and Bicol language	79	24.8 %
Bicol language	5	1.6 %
Filipino language	5	1.6 %
Filipino and Bicol	2	0.6 %
Other languages that students use		
Filipino/Tagalog language	185	58.2 %
English only	101	31.8 %
Bicol language	24	7.5 %
Bisaya language	4	1.3 %
Other	4	1.3 %

Table 4 indicates the language students and teachers use in the classroom. Forty-one percent (131 respondents) stated that they normally use Filipino inside the classroom. On the other hand, eighty-four percent (84%) of all the respondents specified English as the language they use while studying science.

According to 39.3% of the respondents, their teachers use both English and Filipino in teaching science, while 32.1% answered their teacher uses only English. With regard to other language(s) used while studying science, 58.2% of the respondents use Filipino while 31.8% (101 respondents) use English.

Table 5. Grade 3 students' language preference in learning science

	***N*=318**	**%**
Language students are comfortable with while studying science		
Filipino language	198	62.3%
Bicol language	73	23%
English language	47	14.8%
Language students prefer during recitation		
Filipino language	206	64.8%
Bicol language	68	21.4%
English language	44	13.8%
Language students prefer when following science teacher's instructions		
Filipino language	130	40.9%
English language	114	35.8%
Bicol language	74	23.3%
Language that students prefer during science class		
Filipino language	131	41.2%
English language	124	39%
Bicol language	63	19.8%
Language students prefer when reading about science		
Filipino language	129	40.6%
English language	109	34.3%
Bicol language	80	25.2%

In Table 5, 62.3 % of the respondents identified Filipino as the language they are comfortable with while studying science, whereas 23% (73 students) indicated Bicol as the language they are comfortable with. 206 students (64.8%) responded they are more relaxed during class recitations if they use the Filipino language while 68 (21.4%) respondents confirmed ease in using the Bicol language. 40.9% of the respondents prefer their teacher to use the Filipino language in giving directions during science class activities. A total of 131 (41.2%) respondents out of 318 selected Filipino as the language they prefer during science classes while 124 (39%) chose English.

One hundred twenty-nine (40.6%) of the respondents pointed out that Filipino makes reading and understanding science easy, whereas 34% maintained it is English.

Table 6. Grade 3 students' language preference in science related activities

	N=318	%
Language students prefer their teacher use while teaching science		
Filipino language	159	50%
English language	97	30.5%
Bicol language	62	19.5%
Do students understand science class in English?		
Yes	156	49.1%
A little bit	147	46.2%
No	15	4.7%
Language students find difficult during exam		
English language	236	74.2%
Filipino language	41	12.9%
Bicol language	41	12.9%
Language students prefer during exam		
Filipino language	180	56.6%
Bicol language	93	29.2%
English language	45	14.2%
Language students prefer when doing homework		
Filipino language	172	54.1%
Bicol language	85	26.7%
English language	61	19.2%

In Table 6, 50% of the student respondents selected Filipino as the language they can understand best if utilized by their teacher in science class, while at least 30% chose English.

One hundred fifty-six students (49.1 %) understand science lessons in English, 46.2 % can understand it slightly; 4.7% of the respondents cannot understand the lessons in English.

Majority of the respondents (74%) regarded English as the language that is difficult in science examinations, while 56.6% stated that Filipino is easier to use during examinations. Lastly, 54.1% of the respondents prefer using Filipino when doing their homework, 26.7% favor the Bicol language, only 19.2% respondents like using English.

6.2 Grade 4 Students

Table 7. Socio-demographic characteristics of the Grade 4 students.

Age	Number of Students		Total	
	Male	Female		
9	25	36	61	20.1%
10	102	94	196	64.7%
11	22	12	34	11.2%
12	4	3	7	2.53%
13	0	2	2	0.7%
14	2	1	3	1%
Total	155 (51.2%)	148 (48.8 %)	303	100%

Of the 303 grade 4 student respondents, 148 (48.8%) were female while 155 (51.2%) were male. The age of the respondents ranged between 9 and 14. One hundred ninety-six (64.7 %) students were 10 years old while the oldest were 3 students, 14 years of age. The 12 students aged 13 and 14 were repeaters. Similar to the grade 3 respondents who were repeaters these particular students had to help their parents earn a living to provide for their basic needs.

Table 8. Grade 4 students' understanding of the language

	N=303	%
Bicol language		
Yes	265	87.5%
A little bit	38	12.5%
Filipino Language		
Yes	269	89.3%
A little bit	29	8.5%
No	5	2.2%

In table 8, majority of the grade 4 respondents answered that they understand Bicol, while a small number stated that they can slightly understand the language, indicating that these students' first language is not Bicol. Subsequently, most of the student respondents maintained that they understand the Filipino language.

Table 9. Grade 4 students' extent of use of the languages in and outside their home

	N=303	%
Language that the students use at home		
Bicol language	234	77.2%
Filipino language	59	19.5%
English language	10	3.3%
Language that students use outside their home		
Bicol language	224	73.9%
Filipino language	75	24.8%
English language	4	1.3%
Language that students use when talking to friends		
Bicol language	203	67%
Filipino language	97	32%
English language	3	1%

Majority of the students normally use the Bicol language in their daily conversations at home with their family and other relatives (Table 9). A large percentage of the respondents also use Bicol outside their homes particularly with neighbors and in public places like the town park and the market. Results also indicate that most student respondents also use the Bicol language while talking with friends.

Table 10. Grade 3 students' language preference in science related activities

	N=303	%
Language that the students use inside the classroom when conversing with classmates and teachers		
Filipino language	133	43.9%
Bicol language	112	37%
English language	58	19.1%
Language that students use during science class		
English language	258	85.1%
Filipino language	23	7.6%
Bicol language	22	7.3%
Language teachers use when teaching science		
English and Filipino language	127	41.9%
English	98	32.3%
English, Filipino and Bicol language	66	21.8%
Bicol language	5	1.7%
Filipino language	4	1.3%
Filipino and Bicol	3	1%
Other languages that students use		
Filipino/Tagalog language	161	53.1%
only	114	37.6%
Bicol language	20	6.6%
Bisaya language	4	1.3%
Other	4	1.3%

Inside the classroom, a large percentage of respondents converse with their classmates, school staff and their teachers using the Filipino language, on the other hand about 37% of the students speak to their classmates and teachers in Bicol.

Majority of the students stated that they use the English language during science class. This would be the case in most public schools in the country where the medium of instruction in science is English. With regards to the language teachers use in teaching science, 127 students (41.6%) claimed that their teachers use both English and Filipino, in which it can be inferred that the teachers switch from English to Filipino to make students understand science concepts. On the other hand, 98 (32.3%) respondents stated that their teachers only use English in teaching science concepts, suggesting that their teachers mainly teach science using English as the medium of instruction. In studying science individually, 161 (53.1%) respondents said they use Filipino, whereas 114 (37.6%) affirmed they use English. Only 20 (6.6%) respondents chose the Bicol language.

A total of eight respondents answered that they use other languages besides English, Filipino and Bicol, which suggests they came from other provinces outside the Bicol region. Four respondents stated that they speak the Visaya language, one of the major languages in the Philippines.

Table 11. Grade 4 students' language preference in science class

	***N*=303**	**%**
Language students are comfortable with while studying science		
Filipino language	178	58.7 %
Bicol language	82	27.1%
English language	43	14.2%
Language students prefer during recitation		
Filipino language	201	66.3%
Bicol language	56	18.5%
English language	46	15.2%
Language students prefer when following science teacher's instructions		
Filipino language	129	42.6%
English language	103	34.0%
Bicol language	71	23.4%
Language that students prefer during science class		
English language	124	40.9%
Filipino language	121	39.9%
Bicol language	58	19.1%
Language students prefer when reading about science		
Filipino language	124	40.9%
English language	104	34.3%
Bicol language	75	24.8%

Table 11 shows the language the respondents prefer using in a science lesson. More than fifty percent of the respondents revealed that they are comfortable with English in learning science in the classroom. On the other hand, a greater number of the student respondents said they are more relaxed during class recitations if they use the Filipino language, which indicate that the students are more confident in expressing their ideas using the language they often use at school. Respondents (42.6%) also stated that they prefer Filipino when following their teachers' directions and instructions during science class activities such as experiments and group works.

However, according to 40.9 % of the respondents, they prefer the use of English during science classes compared to the students (39.9%) who favor the use of the Filipino language. This result is contradictory to the students' language preference, which is Filipino, during recitation, reading, following teacher's instructions and in doing their homework all of which are activities in a science class. Further analysis reveals that a large number of students from section 1 chose English in processing ideas during science class. It is important to note that the majority of the respondents who are from section 1 are considered the most intelligent and high achievers in academics. Section 2 students are evaluated average achievers in academics while the students from section 3 are students who are generally performing poorly in academics.

Reading and understanding science in Filipino are easy for 124 (40.9%) student respondents. In contrast, 104 respondents (34.3%) are at ease when reading and understanding science in English.

Table 12. Grade 4 students' language preference in science related activities

	N=303	%
Language students prefer their teacher use while teaching science		
Filipino language	151	49.8%
English language	89	29.4%
Bicol language	63	20.8%
Do students understand science class in English?		
Yes	149	49.2%
A little bit	140	46.2%
No	14	4.6%
Language students find difficult during exam		
English language	233	76.9%
Filipino language	41	13.5%
Bicol language	29	9.6%
Language students prefer during exam		
Filipino language	177	58.4%
Bicol language	85	28.1%
English language	41	13.5%
Language students prefer when doing homework		
Filipino language	176	58.1%
Bicol language	79	26.1%
English language	48	15.8%

Table 12 shows almost fifty percent of student respondents affirmed that they prefer their teachers to use Filipino in teaching science, on the other hand, at least 29 % favor English.

Subsequently, students were also asked if they understand science lessons in English. One hundred forty six respondents (46.2 %) answered "yes" while 149 (49.2 %) answered "A bit", and 14 (4.6%) of the respondents said "no".

Majority of the respondents verified that science tests are difficult when done in English, while more than half of the respondents stated that using Filipino makes science tests easy. Lastly, a greater number of student respondents expressed Filipino as the language they are more confident and comfortable with when accomplishing their homework compared to students who favor the English and Bicol languages.

Comparison of Grade 3 and 4 students' language preferences

Most students in both grade levels use English while studying and learning in a science class as it is the required language of instruction. However, teachers also use Filipino as a bridge to help students understand science concepts.

In classroom conversations, a higher percentage of grade 3 and 4 students prefer using the Filipino language, followed by students who prefer Bicol. Grade 3 and 4 students differ in their language preference in the science class. Majority of the grade 3 students are comfortable with Filipino whereas grade 4 are at ease with English. The conclusion that can be gleaned from these results is that the students' sense of comfortability with a language in a science classroom depends on the grade level of the students. However, both grade levels prefer using the Filipino language when following their teachers' instructions during science class activities, reading, class recitation, science tests and when doing their homework. The conclusion that can be obtained from these results is that although grade 4 students are partial to using English during science class, the students from both grade levels prefer Filipino to comprehend their teachers' instructions and reading materials, and to express their thoughts and ideas.

A slightly larger overall percentage of grade 3 respondents favor the use of the Filipino language during science classes. In contrast, grade 4 respondents prefer the use of English during science classes. Although when the means were compared to those who prefer the Filipino language, there was only a slim difference in the overall percentage. However, with further analysis, majority of those students who prefer English are the academically high performing students from section 1. Those students were assigned to that particular section prior to the start of the school year based on their overall academic performance the previous year. On the other hand, majority of student respondents who indicated that they prefer the Filipino language during science classes belong to section 2 and section 3. These students were also assigned to the lower sections

because of their average and low academic performance.

Comparison: Language preference of three sections in grade 3 and grade 4

Results of the survey show that a greater percentage of students from sections 1, 2 and 3 in grades 3 and 4 prefer using the Filipino language during class recitations, examinations, doing their homework and when reading science texts. Furthermore, a high percentage of student respondents from the three sections in each grade level prefer their teachers to use Filipino when giving instructions during science class activities and when teaching science.

7. Conclusion

The research revealed that, although Bicol is the students' mother tongue in the province and English is the medium of instruction in science, most of the respondents' prefer Filipino (national language), in learning and comprehending science concepts, following instructions and in conveying their ideas.

The language can be a good instructional medium for concept development, motivation and interactive learning in science since students are familiar with the language being used in class activities. Students will be able to relate more science concepts with real life situations as they are able to comprehend the language used in class activities. Using the language students are familiar with also builds up self-confidence, especially in expressing their ideas, since they can explain their concepts in the language they know best.

The study reinforces the principle that learning takes place in the language that students are familiar with. The results of the study indicated that the Filipino language could be a suitable medium of instruction in science education for Bicol-speaking students. Furthermore, this study provided significant information regarding the use of Filipino as medium of instruction in teaching and learning of science concepts in the local areas of the Philippines, especially students who belong to the lower sections (average and below average performing students).

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