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The Reading Comprehension Difficulties in Mathematics of Grade Four Pupils

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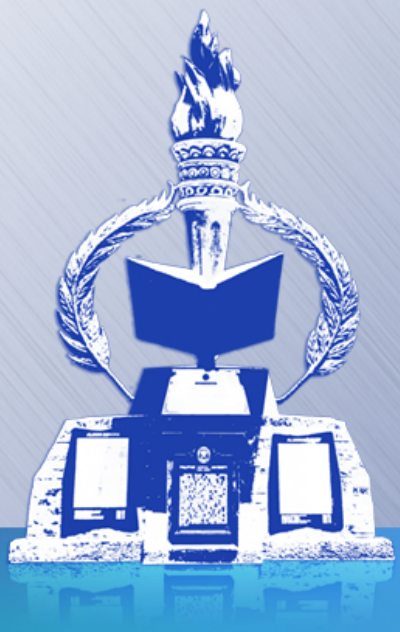

THE READING COMPREHENSION DIFFICULTIES IN MATHEMATICS OF GRADE FOUR PUPILS

A Seminar Paper
Presented to
The National Center for Teacher Education
College of Graduate Studies and Teacher Research
Philippine Normal University
Manila

In Partial Fulfillment
of the Requirements for the Degree
Master of Arts in Teaching
English Language Arts

By

MARIANNE C. BASAÑES

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National Center for Teacher Education

APPROVAL SHEET

This special project entitled **"THE READING COMPREHENSION DIFFICULTIES IN MATHEMATICS OF GRADE FOUR PUPILS"** prepared and submitted by **MARIANNE CASTRO BASAÑES**, in partial fulfillment of the requirements for the degree of Master of Arts in Teaching with Specialization in English Language Arts is hereby recommended for approval and acceptance.

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CERTIFICATION

This is to certify the special project of MARIANNE C. BASANES entitled "*The Reading Comprehension Difficulties in Mathematics of Grade Four Pupils*" **passed** the authenticity test performed by the Office on March 13, 2014, using Anti-Plagiarism software of the University.

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10 March 2014

CERTIFICATION

This is to certify that I have read and edited in its entirety the Seminar paper of MS. MARIANNE C. BASANES entitled " THE READING COMPREHENSION DIFFICULTIES IN MATHEMATICS OF GRADE FOUR PUPILS."

Prof. Ali G. Anudin

Name and Signature of Editor

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M.C.B.

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ABSTRACT

NAME: MARIANNE CASTRO BASAÑES

TITLE: The Reading Comprehension Difficulties In Mathematics of Grade Four Pupils

KEY CONCEPTS: Mathematics education, Reading Comprehension, Comprehension Difficulties, Explicit Teaching and Mathematical skills

DEGREE: Master of Arts in Teaching

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The leveling up of Mathematics education in the Philippines is one of the major concerns of the Department of Education (DepEd). The dismal situation of mathematics achievement in elementary and high school is evident in international, national and regional mathematics test. For instance, the

performance of the Filipino students in the Trends in International Mathematics and Science Study (TIMSS) International Mathematics released in 2004 showed that Philippines ranked 23rd among the twenty-five countries in Mathematics. This paper analyzes the reading difficulties of grade four pupils in their Mathematics classes and the comprehension strategy instruction of Grade 4 teachers.

The study used the descriptive method of research. The initial process was to identify the least mastered skills of the grade four pupils. This was done through the intensive analysis of the table of specifications and the frequency of correct responses of the Math Achievement Test administered for the school year 2010-2011 and its correlations to the explicit reading competencies instruction of Grade 4 Mathematics teachers.

For the initial needs assessment, the researcher used Grade IV pupils of Francisco Balagtas to identify the least mastered mathematical skills. Also, the 35 Grade IV mathematics teachers of different schools from District III and IV were asked to answer the survey questionnaire as the main data gathering instrument for this study adapted from Almasi (2003) to determine the use of explicit teaching in mathematics.

There were skills in the course outline that the grade four pupils had difficulty in. These mathematical skills were Identify the fraction expressed in lowest term, Round off numbers to the nearest hundredths or millions, Adding fraction from a whole number, Order similar fractions written in different forms

from least to greatest, Subtract fraction from a whole number, Find a fractional part of a number, Find the area of a square and Read the legend of a bar graph.

The findings of the study would help both Mathematics and English teachers provide insights on the language needs of the learners in mathematics and other content subject areas, and may show them that aside from the contents of the subject area they handle the manner in which they teach the lessons especially in the case of word problem solving and mathematical expressions should be considered.

CHAPTER I

THE PROBLEM AND ITS SETTING

Introduction

The leveling up of Mathematics education in the Philippines is one of the major concerns of the Department of Education (DepEd). The dismal situation of mathematics achievement in elementary and high school is evident in international, national and regional mathematics test. For instance, the performance of the Filipino students in the Trends in International Mathematics and Science Study (TIMSS) International Mathematics released in 2004 showed that Philippines ranked 23rd among the twenty-five countries in Mathematics, stuck at the bottom while struggling at a passing the level locally students' NAT in both elementary and high school levels revealed below mastery level of 75 percent. In addition, the results of 2012 National Achievement Test for grade three proved this with the mean percentage score of 59.87 in Math.

Looking at the NAT results, DepEd singled out low reading competence as a primary factor for the failure of public school students in mathematics. In reading, comprehension is much needed. It cannot be taken for granted if mathematics performance needs to be enhanced.

Unfortunately, there are many distractions that keep students from reading after class. Their attention is focused on video games and technology

and less follow-up at home greatly affect their mathematical performance in school. Furthermore, in mathematics classrooms, students encounter difficulty in comprehending complex texts such as digital and foreign texts.

With this challenging situation, appropriate measures were undertaken to improve students' performance of the DepEd training of mathematics teachers and strengthening the use of English language as a primary medium of instruction of learning in the public schools. Learning language through content provides an opportunity to teach academic tasks and higher order thinking skills (Met, 1991). Thus an integrated teaching of language and content is not only beneficial but also necessary for students' overall success in school. Despite all these government efforts to improve the quality of mathematics performance as reading skills, the problem in these two areas still continue.

The alarming performance of the Filipino students in mathematics locally, nationally and internationally imposes urgent decision and action for all education sectors. It is now the shared responsibility of the math teachers to address the problem of comprehension instruction even if they are not reading teachers, since reading has already been established as a tool in learning other fields including mathematics.

According to Sammons (2011), "Teachers shoulder an enormous responsibility and our society relies on them to provide solid foundation for the future of our young people." This implies that in mathematics, the purpose of

the problem is often not evident until the end of the problem, and so teachers might need to explicitly state the purpose prior to students reading a problem (Sheldon, 2012).

For generations, Mathematics has been a part of students' struggles. Lee-Chua (2012) singled out that Filipinos have a bad reputation with math problems. In math, knowing the theories and formulas is as important as applying them. Practice exercises and word problems can really help the students improve their mathematical ability.

The Department of Education headed by Education Secretary A. Luistro prioritized, among other things the need to assess the reading capability of students because reading is the foundation of all academic learning.

Expectedly, Education experts around the country worked vigorously together with numerous experts nationwide in order to find the striking points or domains needed in line with the vision of transforming the Filipino teacher into a globally competitive one. Along with the Commission on Higher education (CHED), Teacher Education Institutes (TEIs), Philippine Regulatory Commission (PRC), Department of Education (DepEd) and the Civil Service Commission (CSC) in partnership with the different academic institution, the National Competency-Based Teacher Standards (NCBTS) was born. The NCBTS is "an integrated theoretical framework that defines the different

dimensions of effective teaching in all aspects of a teacher's professional life and in all phases of teacher development" (Department of Education, 2008, p.

7). It is proposed to be used as the guide for all teacher development programs

and projects from the school level up to the national level.Specifically, (NCBTS, 2011) notes that such framework "will allow teachers to self-assess their own performance against the Competency Standards in order to identify areas of strength as well as areas that need to be developed further in order for them to function more effectively as facilitators of learning." Teachers must re-tool themselves with strategies like explicit teaching or direct teaching strategies.

Background of the Study

Reading is a skill. Teaching students to unlock the full meaning of the texts they read is the single most powerful outcome a teacher can foster. If your students can read well, they can essentially do anything. According toLemov (2010), who believes that a person can be recognized according to what he has read and how he reads, and no other single activity has the capacity to yield so much educational value. However, students in many schools spend little time reading. Most likely, they read for less than an hour a day. Even in the reading or literature classes, the students are less likely to

talk about reading or respond to what they have read as what they have actually read.

Reading instruction is most effective when teachers provide students with direct and explicit teaching in the specific skills and strategies that are necessary for reading proficiency. Although such instruction is effective for

teaching a range of reading skills and strategies, it is especially effective in helping students comprehend fully what they read (Nokes& Dole, 2004).

Although most elementary teachers handle reading and mathematics, they need to be aware of the particular difficulties involved in reading mathematical text. When encountering mathematical symbols, students face a multilevel decoding process: First, they must recognize and separate out the confusing mathematical symbols (e.g., +, ×, <) without any phonic cues; second, they must translate each symbol into English; and third, they must connect the symbol to the concept for which it stands and then carry out the operations indicated. (Metsisto et. al., 2005).

In mathematics instruction, mathematics teachers are generalists and have been trained in comprehension instruction. They do not see literacy as part of their skill set. More importantly, they do not appreciate that reading a mathematics text is really very different from other types of reading which requires specific strategies unique to mathematics. On the other hand, most

reading teachers do not teach the necessary skills to successfully read in a mathematics class (Metsisto et. al., 2005).

In an effort to deal with the problem, many school encourage all teachers regardless of their subject area, to emphasize reading in their classes. As Heim (2005) states, " if our goal is to improve students' performance across content areas, then improvements in general reading abilities must be a goal" (p.26).

However, this is often met with a great deal of resistance because most teachers have not been trained in the reading process, but they also do not feel their responsibility to teach reading.

The researcher, who has been teaching for the past 3 years, was assigned in grade 4. With that experience, she noted that there is a problem in terms of math readiness on the basic training in Mathematics like mastering the basic math skills. In particular, the grade four pupils showed the same unpreparedness using guide situations on the same skills. Some responded favorably but others seemed to be lacking in the basic mathematical skills because they had difficulty in executing the tasks. The skills taught only in grade one were observable in the next higher grades. This observation made the researcher decide to help pupils cope with these mathematical skills and competencies.

Knowing the present needs, developing mathematical skills should be reinforced and given due concern and stress by all mathematics teachers.

In line with this, the researcher would like to find out the reading difficulties of grade four pupils in Mathematics of Francisco Balagtas Elementary School.

Theoretical Framework / Conceptual Framework

This study is anchored on the significant ideas of some respected authors in the field of reading and mathematics.

Reading, according to Salazar, et. al (2003) is an active dialogue between the author and the reader, and this is the basic tool for learning in all subjects. It is a skill that helps people to discover the answer to questions about existence.

On the other hand, Marlow (1997) said that reading is a cognitive process that involves communicating, comprehending and learning from written materials. However, mathematical expressions into words could involve several sentences and even paragraphs.

As for the Mathematics part of this study, the least mastered skills of the pupils were analyzed.Many students who experience math difficulties are unable to recall many basic math facts. They have difficulty in understanding the abstract nature of mathematics. Many younger students encounter trouble

connecting their informal knowledge about mathematics to the more formal procedures, language, and symbolic notation of school math. Geary (2004) reported that 5% to 8% of school-age children are identified as having mathematics disability and that many of these students have difficulties in both reading and mathematics instruction. Mathematical difficulties appear to be persistent and evident across elementary and secondary levels and into adulthood.

In view of this, Almasi's (2003) Explicit Teaching Strategies has been the basis in constructing a questionnaire on explicit teaching.

Figure 1 shows the paradigm of the study. It shows Explicit instruction can help address reading difficulties, which in turn may even improve the reading comprehension skills of pupils.

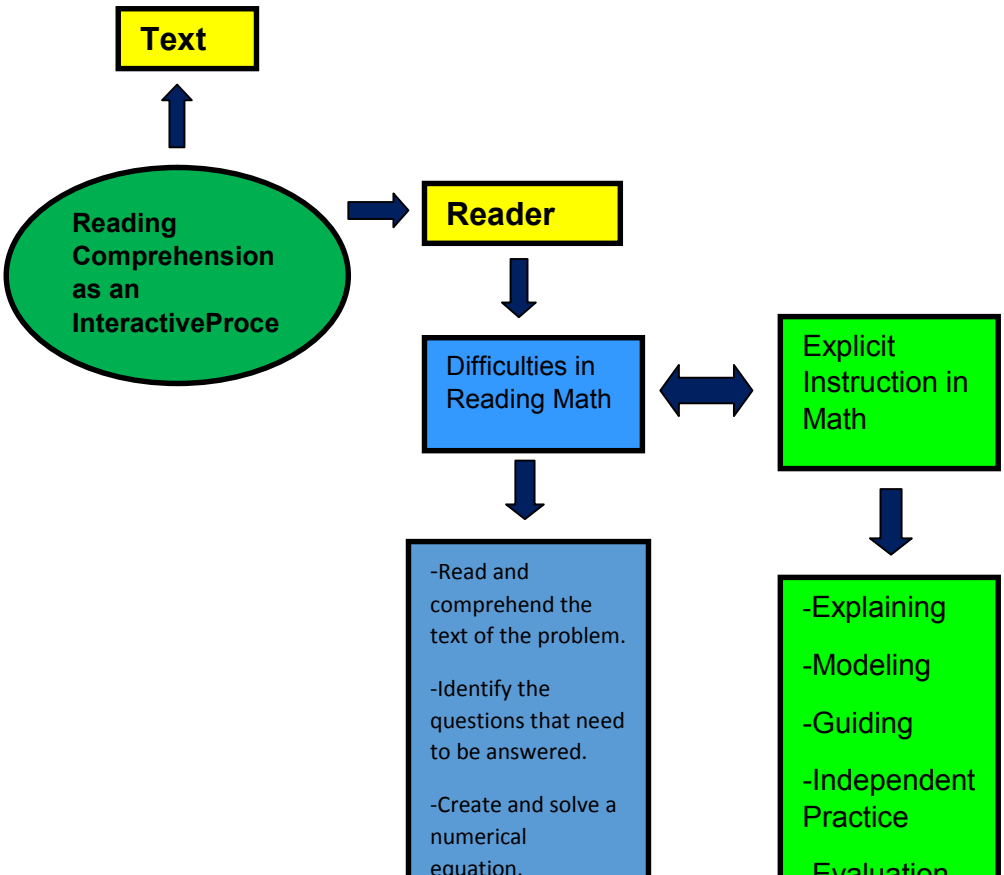


Figure 1. Conceptual Paradigm

Reading is an interactive process between the text and the reader. The text provides various and effective teaching and learning methods to promote logical thinking, inquiry, problem solving, creativity, reasoning and application based on mathematical concepts, principles and rules. However, a young reader have difficulties in reading math such as reading and comprehending the text of the problem, identifying the questions that need to be answered, creating and solving a numerical equation and difficulty reading and understanding the written content in a word problem which can be resolved through explicit instruction in Math which has the following: explaining, modeling, guiding, independent practice and evaluation.

Statement of the Problem

The main purpose of this study was to identify the reading difficulties of grade four pupils in their Mathematics classes and the comprehension strategy instruction of Grade 4 teachers.

Specifically, it sought to answer the following questions:

1. What are the least mastered skills of Grade Four pupils in reading mathematical texts?
2. What are the reading comprehension instruction strategies of the Grade Four Mathematics teachers in relation to the pupils' least mastered skills?
3. What reading instructional materials could be designed to enhance the reading comprehension ability of Grade Four pupils in mathematics?

Significance of the Study

The result of the study may benefit the following:

SCHOOL ADMINISTRATOR

The result of this study could serve as a baseline data to improve programs for school advancement along with the teacher's evaluation, the administrator will be guided in planning and evaluating what is good for the school program.

CURRICULUM PLANNER

The result of this study will help them appraise the existing programs in terms of the pupil's needs and abilities of the pupils; they could change the curriculum or program in order to have a better quality of pupils produced by the school.

ENGLISHTEACHERS

The result of the study may provide insights on the language needs of the learners in mathematics and other content subject areas. Hopefully, they would realize how important it is for students to be competent in the English language.

MATH TEACHERS

This study may show them that aside from the contents of the subject area they handle the manner in which they teach the lessons especially in the case of word problem solving and mathematical expressions should be considered.

PUPILS

The result of this study may help them identify the area where they are weak in which will serve as their basis to improve, develop their interest toward Mathematics and appreciate the importance of Mathematics in their daily lives.

PARENTS

Who are directly concerned with the education of their children, considering school performance in different discipline will be informed about their children's performance in the different disciplines.

FUTURE RESEARCHERS

The result of this study can serve as basis for further studies on teaching-learning activities and student mathematical performance.

Scope and Delimitations

This study was confined only in identifyingthe least mastered skills of Grade Four pupils in reading mathematical texts. The respondents involved were (7) seven sections of grade four pupils enrolled in Francisco Balagtas Elementary School, School Year 2013-2014. This comprises (20) twenty percent of the total grade four pupils of the aforecited school, randomly sampled

to get the precise number of the respondents (34) thirty-four male and (29) twenty-nine female which totaled to (63) sixty- three Grade four pupils. Also, (35) thirty-five grade four teachers handling Mathematics subject from (10) ten

different public schools of District III and IV Manila were used as respondents to know the reading comprehension instruction strategies of the Grade Four Mathematics teachers in relation to the pupils' least mastered skills. The Achievement Test has been the foundation of the Needs Analysis Assessment of the researcher. Identifying the skills would lead in determining the students' difficulties.

Definition of Terms

For clarity and better understanding, the following terms are defined according to how they were used in this study.

Achievement test. A form of standardized testdesigned to measure the knowledge and skills students learned in school or to determine the academic progress they have made over a period of time

Comprehension. It is a complex process that has been understood and explained in number of ways (Pardo, 2004).

Comprehension instruction. It is an instruction that helps students to become independent, strategic, and metacognitive readers who are able to develop, control, and use a variety of comprehension strategies to ensure that they understand what they read.

Comprehension strategies. A reading strategy which helps students become strategic readers (Almasi, 2003; Pressley, 2002).

Explicit instruction.A systematic instructional approach that includes set of delivery and design procedures derived from effective schools research merged with behavior analysis (Hall, 2001).

Mathematical Skills. It is an ability which is developed primarily in mathematics, but also in other subject.

Reading. It is a receptive psycholinguistic process wherein the actor uses strategies to create meaning from text (Goodman, 1988).

Reading Comprehension. It is a process of constructing meaning that involves interaction between readers, and what they bring to text, as well as variables related to text itself with the integration of background, knowledge, vocabulary and previous experiences.

Reading instructional materials. This are the strategy lessons that were prepared by the researcher to assist the teachers of Reading and Mathematics in enhancing the reading comprehension ability of Grade Four pupils in mathematics.

Reading Skills. The ability in reading that helps the reader grasp the meaning, and ideas from the passage.

Reading comprehension skills. It allow readers to move from elementary reading to effective reading.

Teaching ideas. The activities and practices that teachers use with students to help them learn how to use comprehension strategies.

CHAPTER II

REVIEW OF RELATED LITERATURE

This chapter presents the relevant literature and studies that helped the researcher organize her study. These literature and studies offered the researcher a wealth of information on reading comprehension in relation to mathematics, on explicit instruction, and on the interrelationships of some skills taught in English and Mathematics subjects.

Conceptual Literature

Understanding language is a necessity in learning to calculate(Butterworth, 1999). Sousa (2003) reinforced this idea saying that individuals who have strong neural connections between the quantity and language centers are probably to be more proficient in mathematics. According to Butterworth and Sousa this is because mathematical thinking is a highly complex process, which involves a number of areas within the human brain, including at a minimum the frontal lobe, the parietal lobe, the visual cortex, the angular gyrus, Wernicke's area, and Broca's area. The frontal lobe and parietal lobe of the cerebrum are highly involved in mathematical understanding and higher order thinking skills. The visual cortex sets in every time visualization of the math problem is needed. The Wernicke's and Broca's areas are also stimulated whenever thinking involves reading either math problems or word problems.

Brain Lateralization Theory explains the relationship between the learning of Mathematics and English. Based on this theory, the forebrain consists of two cerebral hemispheres, left and right. As the individual matures, he/she develops brain dominance or the inclination to act and think in the mode of either the left or right hemisphere Holder (2003).Hence, dominance in the use of the left hemisphere of the brain signifies that the person will become more adept at tasks that involve language, logic, critical thinking, numbers and reasoning Kendra (2012). It is because the left hemisphere of the brain is associated with logical and analytical thought with mathematical and linear processing of information.

On Reading

Reading is a subtle and complex process which involves sensation, perception, comprehension, reaction, utilization and integration. It is an important basic tool for learning in all the disciplines. Students need not only read in their Reading class. They also need to read in other disciplines like Mathematics and Science. However, a lot of students find reading in Mathematics difficult. This is the same reason why various reading experts have worked in reading in the content area.

Allington (2006) and Cunningham (2009) believe students need to read volumes contending that this has an impact on a student's achievement in reading. Therefore,according to Atwell (2007), "The major predictor of

academic success is the amount of time that a student spends reading" (p. 107).

Salazar, et al (2003) stated that reading is an active dialogue between the author and the reader, and this is the basic tool for learning in all subjects. It is a skill that helps man to discover the answer to questions about existence. It stimulates him to further unlock the mysteries of nature. Moreover, it takes man into the world of though and imagination, an adventure which enables him to acquire a clearer, deeper understanding of reality.

Other homegrown researchers were also able to express their ideas about reading. Villamin (1999) believes that reading unlocks the door to the world or enlightenment and enjoyment. This releases the ideas from the vast storehouse of knowledge and offers an edifying form of recreation. Reading, as facet of language, is considered in the holistic language development. For a person learning to read a second language, the significance of bedrock in language training must be considered. Reading is the act of concentrating on the meaning behind the written words, and not on the words themselves. This is the process of getting the meaning of something written or printed by interpreting its characters or symbols. Printed symbols are merely media used by the author to convey ideas. To interpret them, one must learn to associate a printed work with a spoken word and must understand that it has the same meaning as its spoken counterpart. A reader interacts with print in an effort to understand the author's message.

Reading, according to Zintz (1976), is a process of thinking, evaluating, judging, imagining, reasoning, and problem solving. This process, he believes.varies a task for the young children and as a task for mature readers. Reading for young children who are only starting to learn the skill is different from reading for experienced readers who use the skill as a four step process of perceiving words in print, understanding their meaning in context, reacting to idea presented by the writer, and integrating new learning into their accumulated experience.

Skillful reading requires readers to be active, as does understanding of mathematical ideas. Good readers are actively constructing meaning, using what they know about the content of the text within the given context. They use their knowledge of text structure and word meaning as they draw inferences from the words they read (Hyde, 2006; Owocki, 2003).

The skill of reading should not be an end. Instead, it should be a means to an end. After acquiring the skills in reading, children need to develop the habit of reading and how to apply it on their everyday living

Reading should not stop at reading itself. Readers must allow new information from other areas of learning.

On Reading Comprehension

Comprehension is a process in which readers construct meaning by relating with text through the combination of prior knowledge and previous experience, information of the text and the stance the reader take in relationship to the

text. It is very important to use the knowledge and understandings of how one learns to comprehend to inform classroom practices so they can most effectively help readers develop abilities to comprehend text.

Comprehension as a complex process is also called “active reading”. Deboer and Dallman (1997)state that whenever the reader assumes an attitude of anticipation, active reading happens. This skill requires the reader to go beyond the literal meaning of the word. This refers to a wide variety of ideas not straightly stated, but whose meaning can be understood through pictures accompanying the text, by studying the figurative language, the conversation of the characters, and giving careful consideration to the statements left unspoken for effect.

Jetton & Dole (2004) believe that the process of comprehension begins before one starts to ‘read’ and continues even after the ‘reading’ is finished.Teachers and students also participate in lessons designed to directly teach students about reading strategies for increasing word recognition, fluency, and comprehension.

Reading comprehension includes all the processes related to deriving meaning from written language (including books and other forms of written language) and constructing meaning from written language. Deriving meaning indicates that there is meaning in texts and that meaning needs to be understood. Constructing meaning indicates that often readers go beyond the meaning explicitly contained in the text and add to that meaning based on

their own experience and their ability to infer additional or deeper meaning. Thus reading comprehension is much more than the ability to read individual words and know what those words mean. To comprehend what one reads is to understand the meaningful message sent by the author. Duke (2003) added “navigation” and “critique” to her definition because she believes that readers actually move through the text, finding their way, evaluating the accuracy of the text to see it fits their personal agenda and finally arriving at a self-selected location.

Beers (2003) defines readingstrategies as the processes the readers use to read. Comprehension as a strategic process enables readers to make connections and move beyond literal recall.

Comprehension strategy is a conscious plan that sets of steps that good readers use to make sense of text. This instruction helps students become purposeful, active readers who are in control of their own reading comprehension. Such may include:

1. Making Connections

    Students, most especially children, make personal connections using their background knowledge/prior knowledge (schema). These children usually have different or unique ways in order to connect with the text while reading it. These may include: (a) Text-to-self (T-S) which shows connections made through text and reader’s personal experiences; (b) Text-to-text (T-T), which makes connection done by

relating the text to a text previously read; and lastly (c) Text-to-world (T-W), which occurs when a reader connects a text being read to some events, which take place in the world.

2. Questioning

The art of questioning has a crucial role to a reader's comprehension. This should deepen the understanding of the text children or students are reading. Teachers are expected to use model coding to the different types of questions.

3. Visualizing

Visualization helps readers engage in texts making them personal and memorable. Mental pictures help unfold ideas of the readers making reading a three-dimensional process.

4. Inferring

This strategy is usually referred to as "reading between the lines." It involves forming guesses using proofs such as pictures, context clues, making predictions, drawing conclusions, and finding meaning of unknown words. More operationally, when readers use clues provided by the author and also add information from their own background to draw logical conclusions about meaning, it is making inferences.

5. Determining importance

Knowing the purpose of the text helps determine the significance of the material. When readers know the texts they read are significant or essential they tend to be more interested and this will eventually lead to better understanding of texts.

6. Synthesizing.

Product through process is the result of thinking. The mind of the readers change as they gather more information and this makes the readers reevaluate their knowledge in order to form new schema.

It is worthy to take note that taking general comprehension requires the reader draw information from a text and combine it with information and expectations that the reader already has. It is the bridge from passive reading to active reading – from letters and words to characters and context. It is the crucial link to effective reading which is a strong factor in learning.

On the contrary, Routman (2003) opposes that teachers need to teach strategies to know how to process and understand a text. The understanding in direct meaning of the passage, must also include the ability to recognize implied and inferred meanings. This part of reading process necessitates further mental activity that involves abilities to infer, deduce, and construe the import, purpose and significance of a passage.

With this, Brown and Palinscar (1989, 1984) in Hudson (2007), identified six strategies that affect comprehension, which teachers in reading have to consider:

1. Clarifying the purpose of reading in order to determine the appropriate strategy to use
2. Activating relevant background knowledge and linking it to the text
3. Allocating attention to important pieces of information in the text
4. Evaluating content for internal consistency and compatibility with prior knowledge
5. Self-monitoring and self-regulation of comprehension
6. Drawing and testing inferences regarding the text message

Furthermore, Hudson (2007) presentscharacteristics of instruction specifically designed to encourage learners to become more strategic in reading. The following characteristics of instruction are seen to make learners more involved and responsible in their reading. Teachers should: (a) carefully explain the nature and purpose of the strategy; (b)model its use through reading and thinking aloud; (c)provide ample practice and feedback for the students; (d) remind students the benefits of strategy use, and encourage theindependent transfer of these skills to new learning situations; and finally (e) provide a content base so that strategy learning is embedded in authentic purposes.

Strategies that are taught must be determined through task analyses of strategies needed. They should be difficult for the students to apply, but not so difficult that they become frustrated. Moreover, strategies need to be taught

over a sufficient duration for the training to be effective and should be presented over a number of contexts with a variety of texts.

Wilhelm (2001) in Hudson (2007) presentssteps in using think-aloud approaches to teach strategies:

Step	Activity	Comments
1	Choose a short section of text.	Should be interesting and challenging to students
2	Decide on a few strategies to highlight.	Explain the think-aloud process to students and what strategies they will be trying. Also, explain how these strategies will be helpful.
3	State the purposes.	Enjoy a good story? Write a summary? Study for a test?
4	Read the text aloud to the students and think-aloud as it is read.	Read slowly and stop often to report, target the strategies that are the focus, perhaps stop and predict aloud.
5	Have students underline the words and phrases that appear in the strategy	What words helped to make an inference and make predictions?

6 **7** **8**	List the cues and strategies used. Ask students to identify other situations in which they might use the strategies. Reinforce the think-aloud with follow-up lessons and phases.	Students make a list of signals that prompt strategy use. Discuss which cues helped and which did not. This is aimed at transfer contexts. Teacher does / student watches Teacher does / students help Teacher does / students do Students do / teacher helps Students do / teacher watches and assesses

On Explicit Teaching

Good readers use strategies to support their understanding of text. Teachers help students become good readers by teaching them how to use strategies of monitoring, predicting, inferring, questioning, connecting,

summarizing, visualizing, and organizing (Pardo, 2002). Teachers are explicit and direct in explaining what these strategies are and why good readers use them (Duffy, 2002).

Explicit instructionis a systematic instructional approach that includes set of delivery and design procedures derived from effective schools research merged with behavior analysis (Hall, 2002).

Bases on a body of researches on teaching strategies for comprehension, researchers coined the term explicit instruction to refer to a variety of teacher activities associated with student achievement (Pearson & Gallagher, 1983; Roseshine&Steves, 1984). Explicit instruction came to include not only telling students what they would be learning, but also giving these the procedure and conditional knowledge to do so (Paris, Lipson &Wixson, 1983 cited by Garcia, 2004).

Pressley and Afflerback (1995) affirmed such interest on explicit teaching. Researchers and educators supporting the use of comprehension strategies, have suggested that comprehension instruction should insist of the explicit teaching of various strategies that expert readers use. This is rooted from cognitive and metacognitive research of 1980.

The Explicit teaching of reading is about making the hidden obvious, about exposing and explaining what is taken for granted, about demonstrating mental process, about bringing embedded ideas, values cultural norms to the

surface and about letting the children getting in on the information and strategies that will enable them to become powerful literacy users (Wilkinsons, 1999).Thus, explicit teaching of reading comprehension is intended as a framework for developing comprehension skills and strategies that can applied to other reading situation without teacher support (Tierney &Readence, 2000).

Improvement in comprehension levels is substantiated by research employing explicit teaching of strategy instruction. Although procedure of explicit teaching differs from one study to another, it is still safe to conclude that this kind of instruction emphasizes that reading skill. It can be taught and eventually learned.

On Content-Based Learning Instruction and Mathematics

Optimal understanding of the language of mathematics like understanding any other content areas may require training and/or exposure to the content-based instruction. Content-Based Language Instruction is defined as the integration of content learning with language teaching aims (Brinton, Snow, &Wesche, 1989). This approach specifically:

- Takes into account the interests and needs of the learners
- Incorporates the eventual uses the learner will make of the target language
- Builds on the students' previous learning experiences

- ❖ Allows a focus on use as well as on usage

- ❖ Offers learners the necessary conditions for L2 learning by exposing them to meaningful language in use

Content-based instruction helps reduces the idea that learning mathematics for most students is difficult. This is because the framework of CBLI is anchored onKrashen's Monitor Model, which follows the use of comprehensible input that is a little beyond the learners' current level of competence (i+ 1). Furthermore, it works within the Language-across-the curriculum, which language develops mainly through purposeful use. Learning often involves talking, writing, shaping, and moving. It oftenoccurs through talking, writing, shaping, and moving where language use is seen to contribute to cognitive development of students.

Most importantly, CBI underscores the need to develop higher order thinking skills which enables one to acquire academic as well as communicative competence (*Operations Handbook in English 2002 Basic Education Curriculum).*

CBI is very significant in reading and comprehending the language of mathematics because of the following characteristics as espoused by Brinton, Snow, &Wesche (1989):

1. Straightforward, free from redundancy and paraphrase

   Ex: Apolynomial of one term is a monomial, $2x^3y$

A polynomial of two terms is a binomial, $3x^2y$

2. Conceptually packed or of high density

Ex: To Divide a Monomial by a Monomial

1. Divide the numerical coefficients. Express the quotient as a rational number in the simplestform.

2. Apply the law on dividing powers. Make sure all exponents are written in the positive.

3. Require up-and-down and left-to-right eye movements

Ex: What does 30 divided by 6 equal? 30 30/6 6/30
6

4. Require a slower reading rate than natural language texts

5. *Require multiple readings*

6. Made up of a variety of symbols such as charts and graphs

To see through the realization of the CBLI in learning mathematics, the following specific strategies are suggested:

❖ INTO - students' prior knowledge is probed

Typical Into Activities: oral review, use of content-based visuals, reaction journals, vocabulary previews, free association or visualization exercises, anticipation reaction guides

❖ THROUGH PHASE - students encounter the new content relating it to the concepts from the Into Phase.

Typical activities for the Through Phase: grammar development or vocabulary expansion, reading guides, information gap tasks, text explication exercises

❖ BEYOND PHASE - students further demonstrate their comprehension.

Typical activities for the Beyond Phase: extended oral or written output such as role plays, debates, and essays.

CBLI best works when approaches under it are thoroughly considered. The following are based on the Survey of Teaching Methods & Strategies in CONTENT-BASED LANGUAGE INSTRUCTION (Richards et. al, 2002):

1. COOPERATIVE LEARNING – encourages students to work in small groups with peers in order to learn at optimum level

   **role play *jigsawing *'corners' *think, pair &share *debate *brainstorming*

2. TASK-BASED or EXPERIENTIAL LEARNING – appropriate contexts are provided for developing thinking & study skills as well as language & academic concepts for students of different levels of language proficiency
3. WHOLE LANGUAGE APPROACH – an integrated approach to language instruction within a context that is meaningful to students
4. GRAPHIC ORGANIZERS – graphs, realia, tables, maps, flowcharts, timelines, & Venn diagrams are used to help students place information in a comprehensible input

   **consequence diagrams/decision trees *flowcharts *Venn diagrams *webbing *concept mapping*

5. READING IN THE CONTENT AREAS

**KWL (Knows-Wants-Learned)*

**PreP (Pre-reading Plan)*

**Anticipation Guide*

**DRTA (Directed Reading Thinking Activity)*

**SQ3R (Survey, Question, Read, Recite, Review)*

5. INTERACTIVE STRATEGIES

**Field Experiences*

**Interviews*

**Cloze*

**Dialogue Journals*

**Drama/Role Play*

Teachers play a vital role in employing the CBLI. Therefore the following characteristics are expected among teachers in the use of CBLI: use the target language consistently; recognize that learners are active constructors of meaning and plan accordingly; provide meaningful, communicative, significant contexts for language learning to occur; include reading and writing as tools even in early stages of language development; assess performance frequently and regularly; base planning on themes; follow a communicative syllabus yet are aware of the need to focus on form in the context of content instruction; develop “pre-task” activities linked to students’ prior knowledge; emphasize tasks that are cognitively engaging and intrinsically motivating; maximize student output and provide for opportunities

for students to produce extended discourse; provide for student-centered activities (activity-based learning and individual choice in activities); and step out of the role of "teacher as expert" and be willing to learn with and from students.

On Reading in Mathematics

In Comprehending Math: Adapting Reading Strategies to Teach Mathematics, K-6, Hyde (2006) describes how thinking, language and mathematics are braided together into a tightly knit entity like a rope that is stronger than the individual strands. Reading is closely linked to thinking and language and with Mathematics. In reading, students use decoding skills and then go a step further to construct meaning by interacting with the text. In mathematics, students are encouraged to use the same strategies as they construct mathematical meaning (Sammons, 2009). In fact, many characteristics of good readers are found among good mathematicians (Minton, 2007).

Furthermore, research has shown that when students converse about mathematical concepts, the content becomes more meaningful and relevant (Baxter, Woodward, & Olson, 2005).

According to Minton (2007), "memory, language, attention, temporal-sequential ordering, higher-order cognition, and spatial ordering are among the neurodevelopmental functions that play a role when children think with numbers" (p. 26).

Students need to use their memory to recall formula and rules, cognition to find multiple ways to solve problems, and spatial ordering to work with geometric shapes and symbols. Mathematics instruction should be engaging and interactive, allowing students to try out problem solving strategies and reflect upon these strategies (Burns, 2004).

Both reading and mathematics require purposeful thinking for the construction of meaning. They both involve giving of big ideas from a set of discrete words, procedures or symbols. Readers and mathematicians must be able to generate ideas, express ideas clearly and with precision and to justify thinking their thinking to others (Carpenter, Franke, & Levi 2003). Naturally, the same comprehension strategies are effective when applied in either of the disciplines.

The National Literacy and Numeracy Strategy, *Literacy and Numeracy for Learning and Life* (2011), states that positive attitude and motivation are vital for progression in literacy and numeracy. It also states that all learners should benefit from the opportunity to experience the joy and excitement of getting 'lost' in a book (in both paper based and digital formats)" (p. 43).

Just as good readers create meaning for understanding, mathematicians create meaning as they process mathematical concepts and solve problems. Understanding the relationship between two disciplines can provide teachers with valuable insights to help students more successfully

understand the mathematics in school and in the real world. (Sammons, 2011).

Generally, problem solving in Mathematics is presented either in the form of numericalequations or word problems. Problemsolving in basic or

elementary mathematics deals mainly on the use of word problems. Word problems are usually descriptions of problem situations for which there may be arithmetic answers. They are mathematics exercises expressed as a hypothetical situation explained in words. They include information given in text format rather than mathematical notations.

Mayer (1992) explained that in order to solve a problem, a person needs to have linguistic knowledge, semantic knowledge, schematic knowledge, strategic knowledge and procedural knowledge. Linguistic knowledge is the knowledge of the English language. Semantic knowledge is the knowledge of facts about the world. Schematic knowledge is the knowledge of problem types. Strategic knowledge involves the techniques for how to use the various types of available knowledge in planning and monitoring the solution of problems. Procedural knowledge is the knowledge of how to perform a sequence of operations. His steps in problem solving include problem representation and problem solution.

Problem representation is done by converting the words of the problem into an internal mental representation. It has subprocesses, namely the *problem translation* which involves converting each sentence or major clause

into an internal mental representation, and the *problem integration* which involves combining the information into a coherent structure. The translation process depends on linguistic and semantic knowledge, whereas the integration process depends on strategic knowledge. Similarly, the second step, problem solution,

also has two sub processes. The first sub process is *solution planning and monitoring* which involves developing and keeping track of a plan to solve the problem. The second sub process is *solution execution* which involves carrying out the plan. Planning and monitoring depend on strategic knowledge whereas execution depends on procedural knowledge.

Related Studies

In this review of related studies, the researcher included the studies that focused on the studies that relate Mathematics to English.

The National Mathematics Advisory Panel Report (2008) found that explicit instruction was primarily effective for computation (i.e., basic math operations), but not as effective for higher order problem solving.

Gerald Duffy (2003) has written extensively about explicit instruction in comprehension. His book, *Explaining Reading: A Resource for Teaching Concepts, Skills, and Strategies*,is an excellent resource. Duffy (2003) uses the term "explanation". An explicit explanation involves providing information,

modeling, and providing guided practice. Time is of the essence, and explicit instruction provides an efficient method for skill development.

In addition, research has shown that teachers who model and explain effective comprehension strategies help students become strategic readers (Almasi, 2003; Pressley, 2002).The teaching of reading needs to include a range of comprehension strategies. These strategies need to be explicitly taught toward developing independent readers who engage meaningfully with text (Pardo, 2004).

Cavales (2004) looked into the effects of reading comprehension instruction on the students' performance in solving word problems in algebra. The quasi-experimental design was utilized in her study, specifically the Pretest-Posttest Two Group Design. Two intact sections of algebra classes at Xavier University were studied for two weeks. One class underwent explicit instruction for reading comprehension while the other class was just exposed to the traditional way of teaching verbal problems. Cavales (2004) used four instruments in the form of Mathematics Placement Test, Reading Comprehension in English Test, Reading Comprehension in Math Test, and Problem Solving Test. Both quantitative and qualitative analyses of the data gathered were made which led her to the following findings:

(1) The method of instruction has a significant effect and can contribute to reading comprehension in Mathematics;

(2) The method of instruction and reading comprehension in Mathematics have a significant effect and can contribute in improving the students' performance in problems solving;

(3) The qualitative discussion showed that (1) listing down the important words and phrases, (2) rewriting the words and phrases into their own words, and (3) translating their rewritten words or phrases to mathematical symbols are what helped the students come up with accurate solutions in their problem solving tasks.

Martinez (2001) studied the effect of the language of teaching and learning on the performance of grade five pupils in mathematics. Her study made use of the experimental design, pretest and posttest control design. Experimental and control groups with twenty-three students in each group were formed. The control group used English while the experimental group used Filipino as the medium of instruction. Instruments used were lesson plans and a self-made test. The pretest was administered to the participants while the post test was given after days of exposure to their respective medium of instruction. T-tests were analyzed in analyzing the result. She concluded that (1) language has no significant effect in the learning performance of the students for as long as they can understand the concepts and (2) Filipino can also be used to learn the topics in Mathematics since it was the language native to them.

Barton and Barton's (2005) studies were conceptualized to better recognize the relationship between English language and mathematics learning of students, the investigations explored the extent of any difficulties in learning mathematics, which may be attributed to low proficiency in English language, and also determining particular language features that might have caused the problems for EAL (English as Additional Language) students. The studies had senior secondary students and third year undergraduate levels of mathematics learning. Participants were mainly from Mandarin, Tongan, or Samoan language backgrounds although there were also English native speakers. Two methodological approaches were applied in the studies. The investigative approach was used to find out more about the situations of different EAL students by looking closely at their individual experiences of mathematics learning in English, observing their classroom situations and looking at their work, asking them questions, and talking to them about their successes and difficulties. The scientific approach was used by administering tests and by testing particular hypotheses for the study. The results of the studies revealed that (1) EAL students suffer a disadvantage in mathematics learning due to language difficulties; (2) both general and technical English were factors in the problems experienced by EAL students; (3) prepositions and word order were key features causing problems at all levels as well as logical structures such as implication, conditionals, and negation, both at

senior secondary and third year university levels; and (4) language difficulties seem to limit students' mathematical solving techniques.

Tchoshanov's (2006) observed the impact of problem posing and language on performance of elementary school students in solving mathematics word problems. He had 141 second graders from an urban public school as respondents. He collected his data using trick problems presented in short and extended versions. The word problems were posed in English in the monolingual class, and both English and Spanish in a bilingual class. The results of his study showed that there is a strong impact of the problem posing variable on the students' performance due to significant difference between their performances in the short and extended versions of the word problems. The study also showed a small impact the language variable had on students' performance.

Bandol (2004) aimed his study to analyze the performance of grade six pupils of Sto. Rosario Elementary School in Angeles City in problem solving also on the four fundamental operations. He used the descriptive method of research. Instruments in the form of questionnaires, interviews and word problem exams were used in gathering data. The study found out that the common problems and difficulties based on the exam in problem solving are the lack of the ability of the respondents to identify proper processes with the situations given in the problem, lack of ability to perform the operations

accurately, failure to comprehend the problem, absolute inability to do reflective thinking, and inability to understand quantitative relations.

Martin (2002) in her study determined and analyzed the word problem analysis skills and reading skills in math of first year high school students of the Jose Rizal University. The study employed the descriptive-survey method where two hundred eighty (280) student-respondents were studied. The instruments used were word problem analysis and reading tests and questionnaires and checklists on the causes of difficulties and remedial measures. Her study had the following findings:

(1) On the level of performance of the first year high school students in the word problem analysis skills in mathematics, both male and female performed best in identifying what are given, and both male and female performed least in identifying the processes to be used;

(2) On the level of performance of the first year high school students in the reading skills, both male and female performed best in noting details, and both male and female performed least in drawing conclusions.

(3) No significant difference in the Mean Percentage Scores between male and female respondents in word problem analysis skills;

(4) No significant difference in the Mean Percentage Scores between male and female respondents in reading skills;

(5) No significant difference in between word problem analysis skills and reading skills;

(6) On the extent of probability of causes of the difficulties in word problem analysis skills in Mathematics, both male and female respondents perceived that inability to derive formula and inability to translate English words into mathematical symbols and vice versa are the most probable cause of their difficulties.

Routman (2003) said that teachers need to remember that good comprehension instructions need to be taught explicitly and strategically. With every technique, it is vital that teachers explain and model directly, guiding students on how the technique builds the corresponding strategy. Teachers need to make the strategy a part of their unconscious reading process, so that students are able to combine any number of strategies to problem solve before, during, and after they read (p.129). This transactional approach has been proven to support readers to becoming active, independent readers who bring meaning to reading (Brown, 2008).

Similarly, reading strategies might be taught explicitly in a designated reading support class, students are unlikely to generalize them broadly to

content areas unless teachers also explicitly support and elaborate the strategies use with content-area texts (Torgensen et al, 2007).

However, learners who struggle comprehension strategies are usually not aware of what good comprehenders do and need to be shown how and when to apply a small repertoire of comprehension strategies. Providing students with explicit instruction in comprehension strategies can be an effective way to help them overcome difficulties in understanding texts (Graham &Bellert, 2004). The more explicit the comprehension strategy and self-regulatory instruction, the higher the likelihood that the learner will make significant gains in comprehension (Manset-Williamson & Nelson, 2005).

Several studies showed that graduate level courses and extended in-services regarding content area reading might help teachers feel better prepared to teach reading and understand the advantages of teaching students reading in their content areas (Hall, 2005).

Imam et al. (2013) in their study presentedCorrelation between Reading Comprehension Skills and Students' Performance in Mathematics, the results were students in private schools performed better in reading comprehension skills and mathematics than their counterparts. While reading comprehension skills were insignificantly correlated to private schools students' mathematics performance, the case is different in public schools wherein three skills namely understanding vocabulary in context, getting main idea, and making inference surfaced to have connection with mathematics. The overall students' reading

comprehension skills were not significantly correlated to mathematics performance. Hence, the poor mathematics performance could be explained by other factors not related to reading comprehension skills.

Flores (2007) in her study, developed and validated reading strategy lessons in Science for grade four using the ERICA (Effective Reading in the Content Area) Model. The reading skills of grade four pupils which they have not mastered were identifying the key sentence and supporting sentences in a paragraph; classifying related ideas/concepts under proper headings, Making a two-point outline from the given main idea and supporting details, Identifying sentences that show cause and effect, Show sequence of events using time line, and Compare and contrast similar and different features of two things.

Peralta (2005) has developed and validated instructional guides in developing reading comprehension of grade four pupils. His study emphasized that student must be guided in every phase of a Reading class. These instructional guides well develop learners' automaticity on how to manifest the behaviors of strategic learners.

Garcia (2005) developed and validated explicit strategy instruction based on prototype – instructional guide for first year English teachers of Malabanan High School. Her study was able to reconcile strategies to the reading objectives of the revised BEC 2002; construct and validate explicit strategy instruction based on prototype – instructional guides using the existing format of the prototype lesson plan of the subject utilizing. The Duke

and Pearson's Model of comprehension instruction and Rocheler and Duff's hypothesis on strategy instruction.

Dela Cruz (2004) in his study concluded that students in the secondary level have difficulties reading materials in the content areas especially in Mathematics and Science. The prototype instructional materials based on ERICA (Effective Reading In the Content Area) Model developed in his study can aid the teacher in helping and teaching students become effective readers in different disciplines.

Zamora (2003) showed developed and validated test in Mathematics for Grade Six. Based on his study, the analysis of the items of the test showed that the indices of difficulty of the items of the test are of moderate difficulty. The calculated concurrent validity of the achievement test was 0.636 which is practically higher than the minimum validity coefficient for a test of practical usefulness which is 0.45.

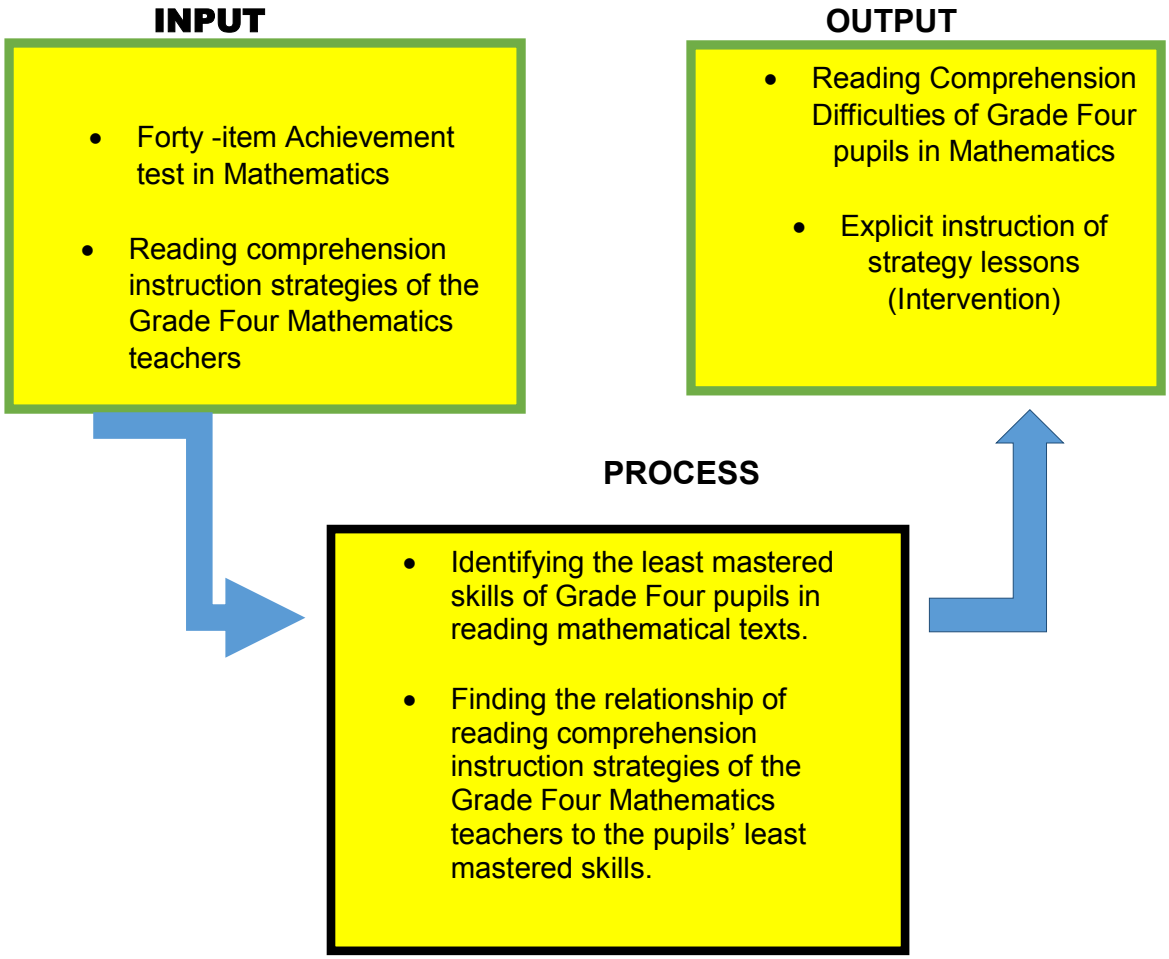
CHAPTER III

METHODOLOGY

This chapter presents the research design, subjects, instruments, procedures, and statistical treatment s used in gathering and analyzing the data. It describes the process of identifying reading comprehension difficulties of grade four pupils in mathematics and it determines the use of explicit teaching to help pupils on reading difficulties.

Research Design

The study used the descriptive method of research. The emphasis of this investigation was to identify the least mastered skill of Grade Four pupils in Mathematics based on the DepEd Achievement Test and their correlations to the reading competencies instruction of Grade 4 Mathematics teachers. Creswell (2003) stated that the descriptive method of research is to gather information about the present existing condition. The researcher used this kind of research to obtain first hand data from the respondents to formulate rational and sound conclusions and recommendations for the study.



Sampling Procedures

A sample is "a smaller collection of units from a population used to determine truths about that population" (Field, 2005). The researcher used Stratified Random Sampling. Robson (1993) states that sampling theory supports stratified random sampling as an efficient choice because the means of the stratified samples are likely to be closer to the mean of the population

overall. The sampling method was conducted at F. Balagtas Elementary School

with approximately (2,200) hundred pupils from kinder to grade six level and (68) teachers from different grade levels. In order to conduct this sampling strategy, the researcher defined the population first of the grade four pupils, listed down all the members of the population and then selected members to make the sample. For this procedure, the lottery sampling or the fish bowl technique was employed.

In this sampling technique, the researcher got random samples in a population composed of Grade four pupils. From each section, the sample size was drawn proportionately with 9 students.

Participants of the study

The respondents who were subjected to the needs analysis were Grade IV pupils in Francisco Balagtas Elementary School. There were sixty three (63) comprised of 34 Male and 29 Female pupils whose ages range from 8 ½ to 11 years old.

The 35 Grade IV mathematics teachers of different schools from District III and IV were also asked to answer the instrument in determining the use of explicit teaching in mathematics.

For the initial try out of the needs assessment, the researcher used the Grade III pupils in F. Balagtas Elementary School. There were out of teachers

who answered the instrument. There are also 6 evaluators who validated the needs assessment. The evaluators were composed of teachers who have

Master's Degree in Teaching Language Arts and Mathematics and had taken up Teaching Reading and Mathematics Courses.

Research Instruments

The survey questionnaire used as the main data gathering instrument for this study was adapted from Almasi (2003). The questionnaire was divided into two main sections: a profile and the survey proper. The first part was the profile of the respondents which contains information on number of years in the service, educational attainment and seminars, trainings, workshops attended, comments and suggestions and the second part was the survey itself. The survey consisted of ten explicit teaching reading strategy items to know their correlations to the explicit reading competencies instruction of Grade 4 Mathematics teachers.

Afterwards, the researcher provided instructional resource materials in teaching Mathematics which employed different strategies that were evaluated by experts and teachers evaluators.

Data Gathering Procedures

This step dealt with the processes had undergone in gathering the needed data in this study. First, the researcher asked permission from the

principal of Francisco Balagtas Elementary School to administer the Division Final Achievement Test in Math to the grade four pupils. After securing permission from the principal, the Achievement Test in Math was administered on the appointed date. Results were analyzed to identify the least mastered skills of the Grade 4 students with the help of the grade chairman.Also, with the approval from the Division of City Schools, the instrument were distributed among the teachers in Districts III and IV handling mathematics subject and gathered it afterwards.

Statistical Treatment of Data

The data obtained were analyzed to find the specific problems of the study. Statistical tools such as frequency, mean, median and mode were used to get the Standard Deviation and Coefficient Variation.

The Pearson Product Moment coefficient of correlation (r) was employed to establish the Correlation between the pupils' achievement test and the explicit reading comprehension instruction of Grade Four Mathematics teachers. The statistical methods used were the following:

1. Frequency

   The frequency distributions were used to classify the respondents according to their educational attainment, seminars or trainings attended, number of years in service and subjects handled.

The frequency also presented the actual response of the respondents to a specific question or item in the questionnaires.

2. Ranking

This was a descriptive method to define the numerical data in order. Friedman Test was employed to get the exact ranking of each mathematical skill.

3. Standard Deviation

The Standard Deviation was used to get the Mean of the 63 sampled students from the seven different Grade IV Math Classes. Hence, the Median and Mode were then included to the Coefficient of Variation.

4. Correlation Coefficient

Another statistical technique that was used by the researcher was the correlation Coefficient. To determine the average responses on the survey questionnaire used. Pearson's R Correlation Test was used to get the precise statistical result, that is Coefficient of Variation = Standard Deviation / Mean.

Procedure

Johnson's Model (1975) provided the method of research and procedure in designing the lessons.adapted by Flores (2007) consisting of four phases are Design Phase, Development Phase, Evaluation Phase and Dissemination Phase.

Phase I (Design Phase)

In preparing the lesson plan to be used, the researcher reviewed the format of the present lesson plans used by the teacher in teaching reading. The lesson plan format was adapted from the Curriculum furnished by the Department of Education. The strategy lessons were comprised of the following parts: Content and Reading Skills in Objectives which contains the goals of reading instruction. The Subject-Matter which cover the topics, references, and materials.

The Learning Activities were divided into (4) four phases to meet the objectives. First, Before Reading (Preparation for Reading) contained here are the activities to review, motivate, define, model and guide; Second, During Reading (Thinking Through) this phase starts of the students' transition in the independent use of strategy. Students used the strategy learned composed of Vocabulary enrichment, Independent Reading, Content Discussion and Strategy Discussion; Third, Post Reading (Organizing Information) which includes Focus skill, Strategy Instruction. Strategies used are assessed; and Translation of information consisting of Generalization and Assignment.

a. Determining the Reading Skills

After determining the topics to be used as content, the researcher determined the reading skills by looking at the English PELC (Philippine Elementary Learning Competencies). Objectives that supported explicit teaching of comprehension strategies. In all the identified skills, the researcher confined (8) mathematical skills on the rank since they did not meet the usual target of 75% mastery as prescribed by the DepEd. The skills where pupils were deficient in were the following: a) Identifying the fraction expressed in lowest term b) Rounding off decimals to the nearest tenth/hundredth/thousandth c) Adding fraction from a whole number d) Ordering similar fractions written in different forms from least to greatest e) Subtracting fraction from a whole number f) Finding a fractional part of a number g) Finding the area of a square and h) Reading the legend of a bar graph.

Phase II (Developmental Phase)

a. Gathering of the reading materials

Various textbooks, journals and workbook intended for grade four readers were surveyed. The reading text were selected based on appropriateness to the strategies to be taught, PELC Objectives, Objectives of explicit instructions and facility of execution.

b. Writing of the materials

The 8 reading strategy lessons in math for grade IV were used. Each topic followed the stage of the ERICA model. Content and Reading Objectives were set in every topic used from a Math text concepts need to be grasped. Thus, goals about the content should be given. Mastery of Reading Comprehension skills and the strategic knowledge are the primary objectives in every topic. Therefore, Objectives on Reading Comprehension Skills must be given emphasized and clearly identified. In this study, Mathematical concepts became the subject matter of the topic.

Phase III (Evaluation Phase)

a. Validating the instrument

There were five evaluators who validated the instruments (See Appendix B). The instrument has a 4-point scale questionnaire where in respondents selected from the scale: Strongly Agree, Agree Disagree and Strongly Disagree. This were arranged from 4 to 1. 4 being the highest and 1, the lowest.

The questionnaire focused on the following inquiries. For content, the evaluators were asked if the content was generally interesting the lesson could enhance the pupils' reading skills. The information was appropriate to the student's level and the lesson was sufficient to allow the students to learn independently. For skill appropriateness, the respondents were asked if the

skills were generally appropriate for the grade four pupils and if the skills in the lessons were useful in helping the learner improve his reading skills. As research language, the questionnaire asked if the language was clear and appropriate for grade four pupils. For format, the evaluators were asked if the material was reader-friendly and attractive in appearance and the items were adequate to attain the objectives. Also, the respondents were asked on their comments and suggestions. The moment the researcher had the validating tool, selection of evaluators followed. The criteria were as follows:

-Educational Background

- ❖ Master Teachers who are teaching in Math and English Teaching Experience
- ❖ Teachers who have taught Math and English classes especially in Reading for more than five years.

The frequency percentage of the responses on the evaluation instrument was determined and described. The responses given and the results obtained served as bases for revising the materials.

b. Data Gathering

Materials and Evaluation Sheets were given to the respective respondents of the study. After a week those sheets were collected and analyzed with emphasis on:

-The general rating of each material

-Specific items when each lesson was rated as highest and the lowest.

The evaluation was analyzed with focus on the following:

-The general rating of each material

-Specific item where each lesson was rated as the highest and lowest

-Additional comment of the evaluator

c. .Revising and writing the final draft. Substantial feedback from the evaluators were taken into consideration in revising the materials:

1. Specific nature of the task, rationale for learning and value should be stated in different items.
2. Provide meaningful problems that can be understood easily by the weaker set of students.
3. In a Grade IV class, a pupils should know the steps on how to solve a mathematical problem. They can memorize the multiplication table.
4. Mathematics test / examinations should not be a multiple choice.
5. Block model approach is highly recommended in teaching Math especially in fraction, decimal and ratio or proportion.

After considering the common suggestions, the reading strategy lessons were prepared.

CHAPTER IV

PRESENTATION, ANALYSIS, AND INTERPRETATION OF DATA

This chapter includes the presentation, analysis and interpretation of the gathered data. The data were collected and then processed in response to the problems. In order to achieve the objectives of the study, the researcher followed the methodology and procedure previously specified. These generated the data gathered, which were presented, analyzed, and interpreted in this chapter.

Table 1 below shows the specifications in mathematics based on the DepEd Final Achievement Test school year 2010-2011 administered to the grade four pupils of Francisco Balagtas Elementary School. It also reveals the percentage of correct answers and the level of mastery per skill as basis to get the frequency of Mastery level.

Table 1

Table of Specification in Mathematics

Skills	Item Placement	No. of items	% Correct	Level of Mastery
1. Identify number through millions in words.	1	1	79%	Good
2. Round off numbers to the nearest hundredths or millions.	2,16	2	27%	Poor
3. Give the value of each digit in a six or more digit.	3	1	56%	Fair
4. Add six or more digit numbers with four or more addends with sums through million with regrouping in any two or more places.	4	1	35%	Poor
5. Estimate the difference of numbers with four to six digits.	7	1	51%	Fair

6. Subtract five or more digit numbers from six or more digit numbers with regrouping.	6	1	52%	Fair
7. Estimate the difference of numbers with four to six digits.	7	1	43%	Poor
8. Multiply five or more digit factors by three-to-five digit factors without regrouping.	8,9	2	33%	Poor
9. Divide five or more digit numbers by two or more digit numbers without remainder.	10	1	37%	Poor
10. Identify fraction part from the illustration	11	1	44%	Poor
11. Order similar fractions written in different forms from least to greatest	12	1	18%	Poor
12. Identify proper fractions from a given set	13	1	46%	Poor
13. Identify the fraction expressed in lowest term	14	1	13%	Poor
14. Identify similar and dissimilar fractions from a given set of fractions.	15	1	32%	Poor
15. Round off decimals to the nearest hundredths	16	1	16%	Poor
16. Add decimals through hundredths without regrouping.	17	1	30%	Poor
17. Subtract decimals through hundredths without regrouping	18	1	40%	Poor
18. Give the place value of each digit of a given decimal through hundredths	19	1	43%	Poor
19. Find the area of a square	20	1	21%	Poor
20. Subtract fraction from a whole number	21	1	19%	Poor
21. Subtract five or more digit numbers from six or more digit numbers with non-continuous zero in both minuend and subtrahend	22	1	22%	Poor
22. Added fraction from a whole number.	23	1	17%	Poor
23. Find the perimeter of a regular polygon	24	1	22%	Poor
24. Find a fractional part of a number	25	1	20%	Poor
25. Read the legend of a bar graph	26,29	2	22%	Poor
26. Find the average of a data presented in a bar graph	27,28,30	3	52%	Fair

27. Identify what was asked in the problem	31	1	60%	Fair
28. Identify what are the given facts.	32	1	25%	Poor
29. Identify operations to be used in the problem.	33	1	37%	Poor
30. Solve two-step word problem involving addition and subtraction.	34	1	24%	Poor
31. Give the final answer to the problem.	35	1	33%	Poor
32. Find the area of a parallelogram and triangle in a square meter.	36,37,38,39,40	5	22%	Poor

Table 2 below shows the frequency of Mastery Level per item of least mastered skills based on the Division Mathematics Achievement Test. Thirty-four (34) or eighty-five (85) percent of the 40-item test yielded poor mastery level while five (5) or thirteen (13) percent got the fair level of mastery and only one (1) or two (2) percent is good in terms of mathematical text level of mastery. These results reveal that pupils have difficulty in mastering the said skills as espoused by Nation et al. (2005), students with poor comprehension generally are poor at making inferences and integrating text information.

Table 2

Frequency of Mastery Level per Item

% of Correct	**Mastery Level**	**Frequency**
95-100%	Excellent	0
85-94%	Very Good	1
75-84%	Good	5
50-74%	Fair	5
<50%	Poor	34
TOTAL		40

Table 3 shows the confined eight (8) least mastered skills out of thirty-four (34) mathematical competencies that are categorized poor mastery level based on the analysis of the frequency of correct responses (See table 2) obtained from the 2010-2011 Division Achievement Test given to the grade four pupils of Francisco Balagtas Elementary School. This led to the identification of the Math topics the target learners did not grasp. Out of 63 pupils, eight (8) or thirteen percent only were able to Identify the fraction expressed in lowest term. This gave the said skill rank 1 which implies that there is difficulty on the said mathematical skills. Ten (10) or sixteen (16) percent could round off numbers to the nearest hundredths or millions. This put the said skill on the least mastered skills on rank 2. Eleven (11) or seventeen (17) percent were able to add fraction from a whole number which made the said skill on rank 3. While ordering similar fractions written in different forms from least to greatest put the said skill on rank 4 at eleven (11) or eighteen (18) percent on the least mastered skills, subtraction of fraction from a whole number got twelve(12) or nineteen (19) percent on rank 5. Only thirteen (13) or twenty (20) percent is able to find a fractional part of a numberon rank 6. Solving two-step word problem involving addition and subtraction skill done in rank 7 on thirteen (13) or twenty-one (21) percent on the least mastered skills. And the last, fourteen (14) or twenty-two (22) percent is able to read the legend of a bar graph, which ranked the skill at number 8. This implies that there is no mastery of the said mathematical skills.

According to Graham &Bellert (2004), providing students with explicit instruction in comprehension strategies can be an effective way to help them overcome difficulties in understanding texts.

Table 3

Least Mastered Skills of Grade IV Pupils in the Division

Final Achievement Test

Grade IV Math Skills	**Item No.**	**% of Correct**	**Level of Mastery**	**Rank**
Round off decimals to the nearest hundredths	16	16%	Poor	2
Order similar fractions written in different forms from least to greatest	12	18%	Poor	4
Identify the fraction expressed in lowest term	14	13%	Poor	1
Subtract fraction from a whole number	21	19%	Poor	5
Adding fraction from a whole number	23	17%	Poor	3
Find a fractional part of a number	25	20%	Poor	6
Read the legend of a bar graph	26,29	22%	Poor	8
Find the area of a square	20	21%	Poor	7

The researcher traced the necessary reading skills of the identified least mastered Mathematics skills from the table of specification on the said test. Theseserved as basis in the preparation of the strategy lessons.

Table 4 below shows the Math topics and the reading skills, which composed every strategy in this study. Based on the eight competencies, the researcher concluded these as the least mastered skills since they did not meet the expected 75% mastery needed as prescribed by the DepEd.

Table 4

Strategy Lesson Number, Math Topics and Unmastered Reading Skills

Strategy Lesson No.	Mathematics Topics	Unmastered Reading Skills
1	Identify the fraction expressed in lowest term	Deduce the team/central idea of a selection
2	Round off decimals to the nearest hundredths	Using the plural form of nouns.
3	Adding fraction from a whole number.	Sum-up the ideas by using concept maps.
4	Order similar fractions written in different forms from least to greatest	Sequencing events/ideas in the selection.
5	Subtract fraction from a whole number	Given an appropriate ending to a situation.
6	Find a fractional part of a number.	Identify sub-headings from a given heading.
7	Find the area of a square	Locate information.
8	Read the legend of a bar graph.	Use comparison of adjectives.

Table 5 below shows the overall mean score of fourteen (14) or thirty-five (35) percent, calculated for the SAT scores of the 63 students from the seven different Grade IV Math Classes. However, since the SAT scores of the

samples were just found to have a Coefficient of Variation (CV) of 0.373, it can be said that the SAT Scores obtained are too spread; hence, this variable is not precise. Consequently, Zamora's (2003) study said that the analysis of the

items of the test showed that the indices of difficulty of the items of the test are of moderate difficulty.

Table 5

Student Achievement Test (SAT) Scores of Representative Students

SAT Score	N	Mean	Median	Mode	Min	Max	SD	CV*
Raw Score	63	14	13	12	6	27	5.224	0.373
Percentage	63	35%	32.50%	30%	13%	68%	13.06%	0.373

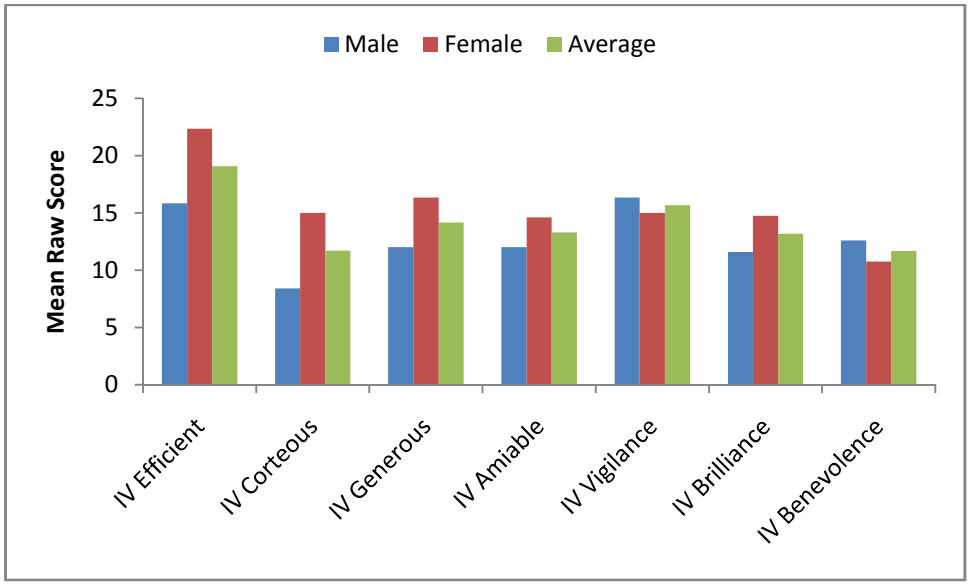
**SAT Scores was found to be too dispersed and not precise.*

Figure 5.1 shows the distribution of Student Achievement Test Scores per sample class. Out of the seven classes observed, five classes were recorded to have higher Female scores than Male Scores. It can be noticed that the average scores of either male or female in most of the classes, except IV Efficient, are below twenty (20) points or fifty (50) percent. In addition, the average SAT Score in all classes barely hit fifty (50) percent indicating that the

overall mastery level of the students studied is poor in the subject matter studied.

Figure 5.1

Distribution of SAT Scores Per Sampled Class



The following tables (6,7,8,9, and 9.1) addressed the question posed in problem statement 2 of this study. Problem statement 2 required that this research determines the explicit reading comprehension instruction strategies of the Grade Four Mathematics teachers.

Specifically, Table 6 shows the educational attainment of the respondents. Rankedfirst are the teachers who have masters units. There are 15 out of 35 who have master's units. Teachers with bachelor's degree got the

second rank. There were 10 out of 35 who were on their first year of teaching. On the third rank are five teachers who finished their master's degree. On the fourth rank are two teacher who have master's degree with doctoral units. There are no teachers yet who finish their doctoral degree.

It only implies that most of the teachers in grade four are elevating their skills and knowledge in teaching by pursuing a higher education.

Table 6

Highest Educational Attainment of Teacher-Respondent

Items	Frequency	Rank
Doctoral Degree	0	5
Master's Degree with Doctoral Units	2	4
Master's Degree	5	3
Bachelor's Degree with Master's Units	18	1
Bachelor's Degree	10	2

Table 7 shows the seminars or conferences attended in different years. The title and content of the seminars were varied and dealt with teaching different subject areas since grade IV teachers are under a team-teaching program. In other words, teachers in grade IV handled 2 -4 subjects and teach 2-3 sections.

Table 7

Respondents' Seminars / Conference Attended for the Last Five Years

Items	Frequency
MTAP (Mathematics Teachers Association of the Philippines)	20
Seminar Workshop in Upgrading Mathematics Teachers	5
Division In-Service Training for Mathematics	8
2013 English and Mathematics Summer Courses	2

Table 8 shows the number of years in teaching of the teacher respondents. There are 17 teachers who are teaching below 5 years thus make it to the rank 1. Rank 2, are 8 teachers who are teaching for 6 -10 years. Tied in rank 3.5 are teachers who are teaching 11-15 years and 31-35 years. Tied in rank 5.5 are teachers teaching for 21-25 years and 26-30 years and 36 years above. Each category include 1 teacher only. There are no teachers who are teaching for 16-20 years. It seems that most teachers in Grade IV are young and active thus can still be trained and receptive to new ideas in teaching.

Table 8

Respondents' Number of Years Teaching

Items	Frequency	Rank
5 years and below	17	1
6-10 years	8	2
11-15	3	3.5

16-20	0	8
21-25	1	5.5
26-30	1	5.5
31-35	3	3.5
36 years above	1	5.5

Table 9 shows the result of the frequency of Teachers' response on Explicit Teaching Strategy. Majority of the samples responded that they strongly agree that they are implementing the explicit strategy among their Grade IV Math Class students. Here, two hundred eight (208) times or fifty nine and forty-three (59.43) percent of the total responses indicate a "Strongly Agree" response while one hundred thirty-eight (138) times or thirty nine and forty-three (39.43) percent of the total responses suggest an "Agree" response. Hence, overall ninety-eight and nine (98.9) percent of the total response either agree or strongly agree that explicit teaching is the method they are implementing. Research has shown that teachers who model and explain effective comprehension strategies helps students become strategic readers (Almasi, 2003; Pressley, 2002).

Table 9

Frequency of Teacher's Response on Explicit Teaching Strategy

Statements	Strongly Agree	Agree	Disagree	Strongly Disagree	Total (N=35)
Statement 1: I ensure to my students that the learning objectives are clear and well-defined.	28	7	0	0	35
Statement 2: I explain what, when, why and how mathematical concepts should be taught.	27	8	0	0	35
Statement 3: I demonstrate and model to my students how a reading strategy is used by explaining mathematical concepts.	23	12	0	0	35
Statement 4: I share with students the specific nature of the task, the rationale for learning and its value to their learning.	16	19	0	0	35
Statement 5: I provide a real life examples in a context that is relevant to					

the student.	21	13	1	0	35
Statement 6: I provide explicit feedback to students that specifically links lesson goals to student responses and performance.	16	18	1	0	35
Statement 7: I provide corrective feedback whenever error occurs.	23	12	0	0	35
Statement 8: I scaffold the learner by allowing time in the lesson conclusion to connect students to reflect on, reformulate or articulate their learning.	18	16	1	0	35
Statement 9: I monitor student's complete mathematical problems at their own pace.	18	16	1	0	35
Statement 10: I closely	18	17	0	0	35

monitor the progress of students receiving supplemental instruction and other students who are at risk.					
Total	**208** (59.43%)	**138** (39.43%)	**4** (1.14%)	**0** (0%)	**350** (100%)

Table 9.1 presents a bar graph distribution of response of the samples, it only implies that the total response mainly strongly agree.

Figure 9.1

Distribution of Response of the Samples

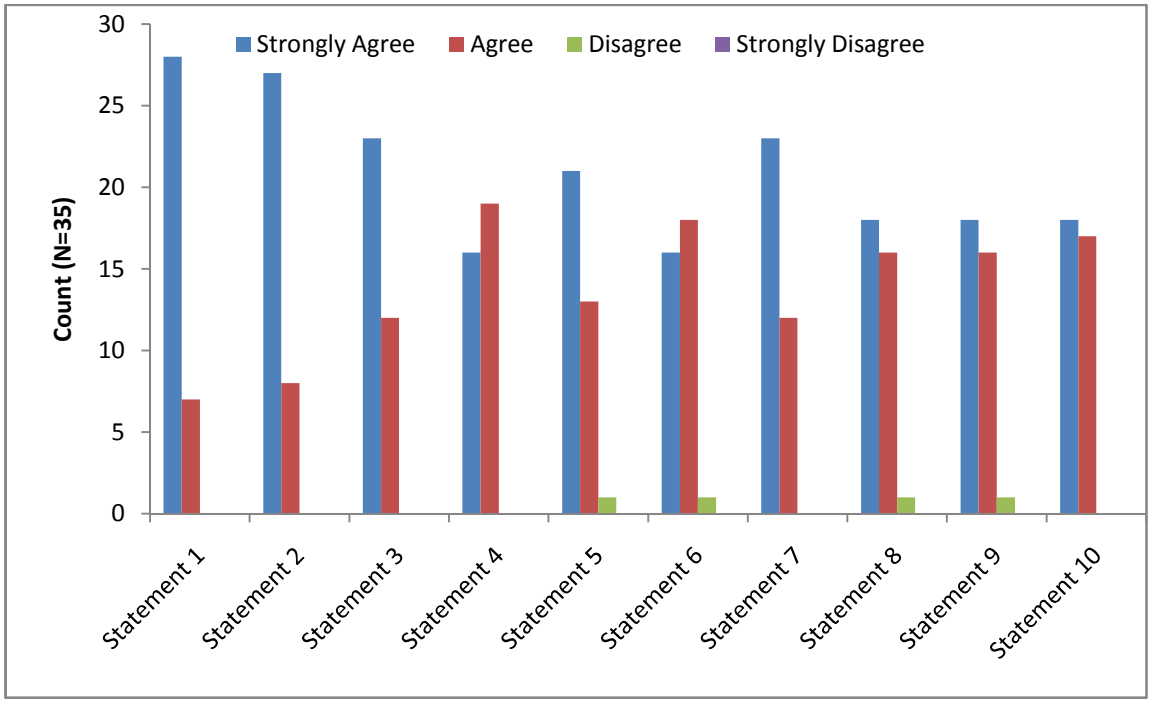


Table 10 and 10.1, addressed the question posed by problem statement 3 of this study. Problem statement 3 required that this research determine the correlation between the pupils' achievement test and the explicit reading comprehension instruction of Grade Four Mathematics teachers.

Table 10 reveals the results that the teacher's level of implementation of explicit teaching strategy in teaching Grade IV Math has a moderate positive relationship with the student SAT Scores as proven by the Pearson's r value of

0.3558. Hence, the higher the level of implementation rate of the said strategy, the higher the possibility that a student will get a higher SAT score. Imam et al. (2013) study said that the overall students' reading comprehension skills were not significantly correlated to mathematics performance. Hence, the poor mathematics performance could be explained by other factors not related to reading comprehension skills.

Table 10

Correlation of the Level of Implementation of Explicit Teaching on the Overall SAT Score of Grade IV Students

Class	**Teacher's Strategy Score (pts.)**	**SAT Score (pts.)**
Class 1	3.7	19.08
Class 2	3.34	11.70

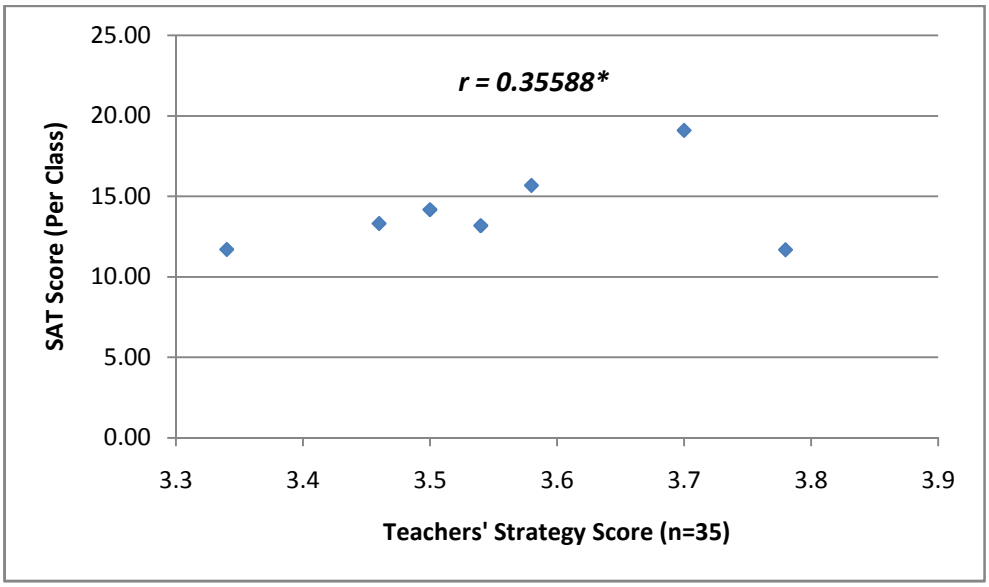
Class 3	3.5	14.17
Class 4	3.46	13.30
Class 5	3.58	15.67
Class 6	3.54	13.18
Class 7	3.78	11.68
Pearson's R value		**0.3558**

Note: Class refers to the Systematically Random Sampling of the Respondents.

In addition, the graph in Figure 10.1, suggests a line gearing to the northeast direction, indicating a positive slope and thereby suggesting that there is a slight increase in either parameter as a result of an increase of the other parameter.

Figure 10.1

Pearson's R correlation of the SAT Score and Teacher Strategy Score



** R = +.30 to +.39 Moderate positive*

CHAPTER V

SUMMARY, CONCLUSIONS, AND RECOMMENDATIONS

This chapter contains the summary and findings of the study, the conclusion drawn and the recommendations it seek ahead.

Summary

The main purpose of this study was to identify the reading difficulties of grade four pupils in their Mathematics classes and the comprehension strategy instruction of Grade 4 teachers.

Specifically, it sought to answer the following questions:

1. What are the least mastered skills of Grade Four pupils in reading mathematical texts?
2. What are the reading comprehension instruction strategies of the Grade Four Mathematics teachers in relation to the pupils' least mastered skills?
3. What reading instructional materials could be designed to enhance the reading comprehension ability of Grade Four pupils in mathematics?

Summary of Findings

Based on the data gathered, the researcher was able to enumerate the following findings:

1. The least mastered skills of Grade Four pupils are the following: a) Identify the fraction expressed in lowest term b) Round off numbers to the

nearest hundredths or millions c) Adding fraction from a whole number d) Order similar fractions written in different forms from least to greatest e) Subtract fraction from a whole number f) Find a fractional part of a number g) Find the area of a square and h) Read the legend of a bar graph.

2. Based from the result of the Division Achievement Test, out of 63 pupils, Thirty-four (34) or eighty-five (85) percent of the respondents 40-item test got a poor mastery level while five (5) or thirteen (13) percent got the fair level of mastery and only one (1) or two (2) percent is good in terms of mathematical text level of mastery.

3. Since the SAT scores of the samples were just found to have a Coefficient of Variation (CV) of 0.373, it can be said that the SAT Scores obtained are too spread; hence, the variable is not precise

4. The distribution of Student Achievement Test Scores per sampled class that five out of the seven classes studied, five classes was recorded to have higher Female scores than Male Scores.

5. The explicit reading comprehension instruction strategies of the Grade Four Mathematics teachers shows that teachers agree based on the ninety-eight and nine (98.9) percent of the total response that explicit teaching is the method they are implementing in their class.

6. That it was determined in this study that the teacher's level of implementation of explicit teaching strategy in teaching Grade IV Math has a

moderate positive relationship with the student SAT Scores as proven by the Pearson's r value of 0.3558 effect to pupils learning process.

Conclusions

Based on the data obtained from the conduct of the study, the following conclusions were formulated.

1. There were skills in the course outline that the grade four pupils had difficulty in. These mathematical skills were Identify the fraction expressed in lowest term, Round off numbers to the nearest hundredths or millions, Adding fraction from a whole number, Order similar fractions written in different forms from least to greatest, Subtract fraction from a whole number, Find a fractional part of a number, Find the area of a square and Read the legend of a bar graph.
2. Based on the response of Grade IV teachers, the implementation of explicit teaching strategy is strictly adhered for the improvement of the reading comprehension of the grade IV pupils.
3. The SAT Scores obtained are too spread and the variable is not precise. This is evident as shown in the SAT scores of the samples to have a Coefficient of Variation (CV) of 0.373.
4. The teacher's level of implementation of explicit teaching strategy in teaching Grade IV Math has a moderate positive relationship with the student SAT Scores as evidenced in Pearson's r value of 0.3558 effect to pupils learning process.

Recommendations

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

1. Provide the appropriate amount of guided practice depending on the difficulty level of the strategies that the students are learning.
2. When teaching comprehension strategies, make sure students understand that the goal is to understand the context of the text.
3. Some teachers lack preservice preparation to teach strategies. They should be provided professional development in direct and explicit instruction of comprehension strategies including coaching them in the classroom as they teach.
4. With credible and triangulated validation, strategy lessons like what the researcher prepared, are encouraged (inspired by the comments of the respondents gathered during the survey) to help students or pupils having reading difficulties.
5. Using comprehension strategies to improve comprehension on different levels of texts should also be institutionalized to cater to different types of learners.

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Appendix D

Appendix A

Philippine Normal University
National Center for Teacher Education
College of Graduate Studies and
Teacher Research

Dear Teachers,

The undersigned is currently working on a seminar paper entitled, “The Reading Comprehension Difficulties in Mathematics of Grade Four Pupils”. Part of the requirements is a research survey that will determine correlation between the pupils’ achievement test and the explicit reading comprehension instruction of Grade Four Mathematics teachers. Having your expertise in the field of teaching, I would like to ask your help by answering the attached questionnaire.

Your honest response will be highly appreciated.

Thank you.

Truly yours,

MARIANNE C. BASAÑES
Researcher / Teacher

Noted:

PROF. MA. JHONA B. ACUÑA
Adviser

Appendix B

Profile of Validators

Validator's Name	School	Present Position	Teaching Years	Subject/Grade Level Taught
1.Miss Aurora V. Ramos	F. Balagtas Elementary School	Master Teacher I	36	English/ Grade V
2.Mrs. Ellen S. Corpus	F. Balagtas Elementary School	Master Teacher I	36	Math, Filipino, Makabayan, GMRC/Grade III
3.Mrs. Gloria C. Sta.Ana	F. Balagtas Elementary School	Master Teacher I	7	Mathematics/Grade VI
4.Mrs. Estrella B. Estrella	F. Balagtas Elementary School	Teacher III	23	Mathematics, HEKASI, EPP/Grade IV
5.Miss Flor B. Abestilla	F. Balagtas Elementary School	Teacher III	26	Math, Filipino, EPP, GMRC/Grade IV