JETIR.ORG ISSN: 2349-5162 | ESTD Year : 2014 | Monthly Issue
JOURNAL OF EMERGING TECHNOLOGIES AND INNOVATIVE RESEARCH (JETIR)
An International Scholarly Open Access, Peer-reviewed, Refereed Journal

DEVELOPING SKILLS OF GRADE SIX PUPILS IN FINDING AREAS OF QUADRILATERALS

BY:

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CHAPTER 1

INTRODUCTION

Our world is changing. It is a world that has become borderless to information, commodities and financial investments. In this new world, people are confronted with an explosion of knowledge. Because of this, our educational system has to educate the Filipino learners so that they become critical thinkers. To actualize a gracious life in this changing world, the Philippines need an educational system that empowers the pupils and students for lifelong learning.

Lifelong learning meets the challenges posed by a rapidly changing world. Because of this, we need to train the young so they become competent in learning how to learn anywhere even when they are left to themselves.

A good education should lay the foundation for lifelong and help to produce creative and productive individuals who are able to contribute to the development of society in all its aspects: economic, political, cultural, etc.

Lifelong learning is functional literacy that includes the development of essential skills not linguistics fluency but also scientific-numerical competence.

It is evident that our country has moved from a manufacturing-based work force to an information rich work environment. This message according to Wagner and Thibeault (1993) is indisputable. If our students and our society compete in the marketplace of the future, our population must be scientifically and technologically

literate. Skills that can be taught in a technologically enriched classroom such as problem solving and creative thinking are becoming increasingly important. To succeed in this technological world, students must be introduced to the skills they will need in their future workplaces because these skills that we expose our students to today will be the foundation on which they build a career and continue to grow in the future.

Fully aware of the challenges of life in a new world and cognizant of the kind of education our country will offer to its young citizens, the state is tasked to promote the right of all citizens to quality education at all levels and to make such education accessible to all. As stipulated in Sec. 2, Article XIV, the 1987 Philippine Constitution is explicit in its directive that the system of education to be established maintained and supported should be relevant to the needs of the people and society. The constitution makes it obligatory upon the State to provide the training referred to in the provision to equip the young learners with knowledge, skills and attitudes necessary for good citizenship and productive employment.

Undisputedly, the maximum development of foundation skills is essential right at the lowest educational ladder a great number of elementary graduates make elementary as their terminal education due to various reasons one of which is poverty. The prevailing situation in the Philippine Educational System is very dissatisfying. The results of the Third International Mathematics and Science Study (TIMSS) and the Third International Mathematics and Science Study Repeat (TIMSS-R) which involved 45 countries where the Philippine placed 39th during the first test and the lowest in Science and Mathematics in the second testing have been actively used in educational discussions the bottom line of which is that our graduates can still hardly complete with their foreign counterparts. This clearly implies that there is still a long way to go before the fulfillment of this educational goal to produce high caliber graduates is realized. An educational vision of many educators has been to build an educational system that produces graduates who can compete with best in the global market and this vision could only be attained if the major educational programs can be implemented effectively.

In the elementary level for instance, it is imperative to develop the foundation skills of the pupils in Mathematics along with English and Science. Aware that a number of enrollees in the elementary ladder cannot finish a college course, the elementary schools must strive harder to provide the necessary learning opportunities in Mathematics so that when a child leaves the portal of elementary education, he is already equipped with the necessary skills he needs to earn a living. The extent of the individual's participation in technological and economic progress of the society where he belongs is dependent upon the extent of training the basic educational

ladder has provided, We live in a mathematical world and ignorance in Mathematics can be tragic. One can easily be deceived be a fraudulent person in a simple business transaction of he does not know his Mathematics.

Cognizant to this, Grossnickle and Bruecher (1997) had this to stay:

"The technological and scientific revolution which is taking place today makes it imperative that school adds emphasis to the development of a pupil's understanding and appreciation of mathematical procedures and methods of reasoning in addition to the traditional study for the uses of mathematics in their houses, business and industry, government and in the physical science.

Consideration must be given to the application of Mathematics in various types of computing machines and in decision-making."

As such San Jose Elementary School being one of the four schools in the district of Sto. Tomas and the second most populated elementary school in town, this study was conducted to determine the level of difficulties among pupils in finding areas of quadrilaterals.

The Problem:

This action research sought to develop the problem solving skills of the Grade VI pupils more particularly in the use of multiplication and division in finding areas of quadrilaterals at the San Jose Elementary School during school year 2012-2013. Specifically, it answered the following sub-problems.

1. What are the difficulties of grade VI pupils mathematics based on the results of the achievement test administered during school year 2011-2012?

2. What are the possible causes of the identified difficulties of the Grade VI pupils in mathematics based on item analysis?

3. What are the strategies and activities that were undertaken to address the identified weaknesses of the Grade VI pupils?

4. What is the effect of the activities that were undertaken to address the identified difficulties of the subject cases?

4.1 Is there a significant difference in the achievement of the Grade VI pupils before and after the activities base have been undertaken?

Research Hypothesis

This research tested the hypothesis "There is a significance difference in the achievement of the Grade VI pupils in Problem Solving more particularly in Multiplication and Division in Finding Areas of Quadrilaterals."

Scope and Delimitation

For the purpose of this study, it is limited to the identified difficulties of the Grade VI pupils in Mathematics more particularly on problem solving involving multiplication and division in finding areas of quadrilaterals.

For the purpose of this research it is delimited to the use of test results of 84 Grade VI pupils enrolled during school year 2012-2013. Strategies and activities were undertaken based on the identified causes of the problem.

CHAPTER II

METHODS AND PROCEDURES

This portion of the paper presents the methods used and procedures followed to answer the research problem which includes research participants, data needed, data gathering procedure, research instrument used and statistical treatment of the data.

Methods and Procedures

This research employed the experimental method. The strategies and activities were undertaken based on the identified difficulties of the Grade VI pupils and the possible causes of such difficulties.

Before the activities have been undertaken, results of the Achievement Test for the past 3 school years were analyzed. After a thorough analysis of such results, possible causes were listed. To ensure that these are real causes of the identified difficulties, an interview with the other Mathematics teachers was made. These teachers were also requested to determine the possible causes of such difficulties. Parents were also interviewed as to possible causes of the identified problem. In addition to the above activities, the Grade VI pupils were observed thoroughly and were interviewed by the researcher.

Research Participants

For the purpose of this study, 84 Grade VI pupils enrolled at the San Jose Elementary School during the school year 2012-2014 were employed as research participants in this study this represents 100 percent of the population of Grade VI pupils of the aforesaid school, of this number 48 male and 36 females.

Data Needed

In dealing with the researched problems, the following data were needed:

a. results of the item analysis of the achievement test in Mathematics administered during school year 2011-2012.

b. list of possible causes of the identified problem based on the report of elementary grades teachers teaching Mathematics subject.

c. results of the Pre-Test administered before strategies and activities have been undertaken.

d. results of the Post Test.

e. compared test results of the Pre-Test and Post-Test.

Data Gathering Procedure

Before the conduct of the experiment, Pre-Test was administered to the 84 Grade VI pupils. The test instrument is standardized in the sense that the items were drawn from the achievement test instrument which was administered by the Division of Pangasinan II.

To determine the possible causes of the identified difficulties, an interview with the Grade VI teachers teaching Mathematics the information derived from them was used to validate the result of the item analysis and an observation was made by this researcher.

With the help of the Master Teacher, the 84 research participants were exposed to varied activities and strategies for three months from June 2012 to August 2012 while it is true that normally, an experimental research take six to eight months, this research has been undertaken for only three months because it involved only one major skill.

A Pre-Test was administered to the 84 participants before the activities and strategies were undertaken. After the second month, a Post-Test were administered and the results were compared.

Statistical Treatment

In dealing with the research problems, the following statistical tools were used:

Mean Percentage Score. To answer sub problems number 1, the mean percentage score was computed for: First the mean was computed using the formula:

$$M = AM + \left[\frac{\sum fd}{N}\right] i$$

Where:

M	=	is the Mean
AM	=	Assumed Mean
$\sum$ fd	=	frequency
N	=	number of Cases
I	=	interval

Then, the Mean Percentage Score was occupied using the formula:

$$MPS = \frac{\text{Mean}}{\text{Highest Possible Score}} \times 100$$

Where: MPS = Mean Percentage Score

t-test – in answer to sub-problem 4.0 and 4.1 and, in testing the research hypothesis, the t-test was employed and the level of significance was set at .05 the formula is:

$$t=\frac{x_1 \quad = \quad x_2}{\sqrt{\frac{(n_1-1)(s_1)_2+(n_{1-1})(s_1)}{n_1 \quad + \quad n_2}}}$$

where: t = t-test
x_1 = mean of the pre-test
x_2 = mean of post-test
n_1 = number of pupils who took the pre-test
n_2 = number of pupils who took the post-test
S_1 = standard deviation of the pre-test
S_2 = standard deviation of the post-test

Definition of Terms and Variables

For clearer understanding, the terms and variables used are operationally defined as follows:

Achievement Test. This is the type of test which assesses or covers the skills/competencies developed for the whole year.

Mathematics. This is one of the learning areas in new Basic Education Curriculum which provides for the development of computational analysis or abstract reasoning and problem solving.

Difficulties. It refers to the percentage of persons in a group who answered an item of the test correctly. The easier the item, the larger is the above are considered items, very easy items, 30 to 69 percent are considered reasonably difficult, and below 30 percent, difficult items.

Mean Percentage Score. It refers to the percentage of mean over highest possible score.

Strategies and Activities. It refers to the action applied to develop identified weaknesses and provided with a solution attributed to the activities undertaken.

CHAPTER III

PRESENTATION, ANALYSIS AND INTERPRETATION OF DATA

This portion of the paper presents, analyzes and interprets a data of the research at hand.

Difficulties of Grade VI pupil in Mathematics based on the results of the Achievement test administered during school year 2011-2012

Table 1

Difficulties of Grade VI pupils in Mathematics based on the results of the Achievement test administered during school year 2011-2012

Skill	No. of Item	Mean	MPS	Descriptive Equivalent
Analyses word problem involving multiplication in finding areas of a quadrilaterals.	3	1.00	33%	Difficulty
Analyzes word problem involving division in finding areas of a quadrilaterals.	3	0.00	0%	Difficulty

Table 1 discloses the difficulties of the Grade VI pupils in Mathematics based on the results of achievement test administered during school year 2011-2012.

Of the three items given each in problem solving involving multiplication and division of quadrilaterals, it is apparent that the Grade VI of along multiplication and 0 along division of quadrilaterals. This means that of a 6 items administered, on the average, the Grade VI pupils performed very poorly in this area as pointed out by a mean 0f 1.00 along multiplication and 0 along division of quadrilaterals. This means that of a 6 items administered, on the average, the Grade VI pupils scored only 2, a clear manifestation that they are really poor along this area.

Table 1-a

Difficulties of Grade VI pupils in Mathematics based on the Pre-Test results administered during the school year 2012-2013

Skill	No. of Item	Mean	MPS	Descriptive Equivalent
Analyzes word problem involving multiplication in finding areas of a quadrilaterals.	10	5.48	37%	Difficulty
Analyzes word problem involving division in finding areas of a quadrilaterals.	10	4.19	28%	Difficulty

From a close scrutiny of the result of the Pre-test as gleaned in table 1-a, one can notice that of the 10 items administered along multiplication of quadrilaterals the mean is only 5.48 with the mean percentage score of 37 percent. Similarly, the mean percentage score along division of quadrilaterals is 4.19 with the mean percentage score of 28 percent. Both mean percentage scores are less than 75 percent standard set by the Department of Education as an indicator of mastery.

Possible Causes of the Identified Difficulties

Of the Grade VI Pupils in Mathematics

Based on Item analysis

This portion of the paper present the possible causes of the identified difficulties of the Grade VI pupils in Mathematics based on the Item Analysis in answer to sub-problem number 2.

As a result of thorough analysis of the test results, observation done, an interview made by the researcher the following causes of the identified problem are identified as:

1. Many pupils can hardly read/poor in comprehension.
2. Lack of mastery of the four fundamentals.
3. Pupils found difficulty in tackling the steps in solving word problems.

4. Pupils are poor in determining the hidden question/s.
5. Pupils have difficulty in determining the operation/s to be used.
6. Poor study habit.
7. Lack of parent's concern or follow-up.

Strategies and Activities that were Undertaken

to Address the Identified Weaknesses

of the Grade VI pupils

To address the identified difficulties of the Grade VI pupils based on the determine possible causes the following activities were undertaken:

a. To develop the comprehension skills, the pupils were expose to adequate vocabulary difficulties were unlocked each pupils were provided with the list of common words that are used in problem solving word problems were taught in Filipino then translated into English. Adequate exercises were also provided, peer teaching was utilized and parents were involved to continue supervision and follow-up at home.

b. To address the need for mastery of the poor fundamentals adequate exercises were provided during their vacant period each pupils was provided with activity cards.

c. Window cards were also provided frequent testing was made in additional items were given to the pupils homework the cooperation of parents were solicited more specifically in following-up the activities at home, different contest were undertaken and awards for the winners were given encouragement for the low performers was done oftentimes and peer teaching was undertaken and supervised closely by the Mathematics teachers.

d. To their identified weaknesses more specifically in determining the hidden questions and operations to be used, more word problems with hidden questions were provided and how to determine hidden questions was fully explain. Regular testing was made to determine the progress of the children. Each child was taught how to assess his progress through the use of graphical presentation.

e. To enlist the support of parents, quarterly conferences were conducted to discuss their problems and difficulties.

All of the things were undertaken for period of two months.

Effect of the Activities that were Undertaken to Address the Identified Difficulties of the Subject Cases

After three months of undertaking the activities as discussed earlier, the Grade VI pupils were given a Post-Test to determine whether there is a progress in their performance as a result of the activities that were undertaken.

Table 2

Result of the Post-Test of the grade VI Pupils in Multiplication and Division of Quadrilaterals

Skill	No. of Item	Mean	MPS	Descriptive Equivalent
Analyzes word problem involving multiplication in finding areas of a quadrilateral.	10	12.45	83%	Passing
Analyzes word problem involving division in finding areas of a quadrilateral.	10	12.61	84%	Passing
TOTAL/AVERAGE	20	12.53	83.54%	Passing

From Table 2, it is obvious that the mean is 12.53 with a Mean Percentage Score of 83.54 percent. This is greater than 75 percent mastery level. This simply means that the activities undertaken are effective on the basis of the increased mastery level.

Significant difference in the Achievement of the Grade VI pupils before and after the activities have been undertaken

Table 3

Significant Difference in the Achievement of Grade VI pupils before and after the Activities

Skill	X_1	S_1	X_2	S_2	SD	t-value	Remarks
Analyzes word problem involving multiplication in finding areas of a quadrilateral.	5.48	0.92	12.45%	1.03	6.97	46.47	S
Analyzes word problem involving division in finding areas of a quadrilateral	4.19	0.74	13%	1.14	8.42		

Level of Significance at .05 = 1.671
Legend: S = Significant

Table 3 below discloses the difference in the achievement of the Grade VI pupils before and after the activities have been undertaken. This is in answer to sub-problem number 4.1 and in testing the research hypothesis.

From Table 3, it is clear that the mean difference is 6.97 of multiplication and 8.42 for division, statistical analysis is with the use of the t-test whose level of significance has set at .05, the computed t-value is 46.47 which went beyond 1.671, a minimum required value for significance, hence, the acceptance of the research hypothesis. This simply means that the significant increase in the mean achievement of the Grade VI pupils can be attributed to the activities that were undertaken to develop the problem solving skills of the Grade VI pupils in Multiplication and Division of Quadrilateral.

CHAPTER IV

SUMMMARY, FINDINGS, CONCLUSIONS AND RECOMMENDATIONS

This chapter presents the summary of the research, it likewise presents the findings, the conclusions drawn from the findings, and the recommendation offered based on the findings and conclusions drawn from.

SUMMARY

This study sought to develop the problem solving skills of the Grade VI pupils at the San Jose Elementary School year 2012-2013 for this purpose, it attempted to determine the difficulties of the Grade VI pupils along problem solving. . It likewise identify the possible causes of the problem identified. It undertook various activities

to address the difficulties of the Grade VI pupils that were identified. Finally, it administered Post-Test and compared the result of that of the Pre-Test to determine whether the increase in the Mean can be attributed to the activities undertaken.

For the purpose of this study, 84 Grade VI pupils were employed as research participants. Mean Percentage Scores and T-test were used in dealing with the research problems.

Findings:

1.0. Difficulties of Grade VI pupils in Mathematics based on the result of the achievement test administered during school year 2011-2012.

Based on the results of the achievement test administered during school year 2011-2012. The Grade VI pupils mean was 1.0 with a mean of percentage score of 33.0 percent which was below the standard performance level of 75 percent.

2.0. Possible causes of the identified difficulties of the Grade VI pupils in Mathematics based on Item Analysis.

Based on the analysis of the test results and observation done by the researcher the following causes are identified: a.) many pupils can hardly read/poor in comprehension; b.) lack of mastery of the four fundamentals; c.) difficulty in tackling the steps in solving word problems; d.) poor in determining the hidden question/s; e.) difficulty in determining the operation/s to use; f.) poor study habit; g.) lack of parents concern.

3.0. Strategies and activities that were undertaken to address the identified weaknesses of the Grade VI pupils.

To address the identified difficulties of the Grade VI pupils based on the determined possible causes the following activities were undertaken:

a.) To develop the comprehension skills, the pupils were expose to adequate vocabulary difficulties were unlocked each pupils were provided with the list of common words that are used in problem solving. Word problems were taught in Filipino then translated into English.

b.) Adequate exercises were also provided, peer teaching was utilized and parents were involved to continue supervision and follow-up at home.

To address the need for mastery of the poor fundamentals,

a.) Adequate exercises were provided during their classroom vacant period each pupils were provided with activity cards.

b.) Window cards were also provided frequent testing was made in additional items were given to the pupils homework.

c.) The cooperation of parents were solicited more specifically in following-up the learning activities at home.

d.) Different contests were undertaken and awards for the winners were given, encouragement for the low performers were done oftentimes.

e.) Peer teaching was undertaken and

f.) Supervised closely by the Mathematics teachers.

Regarding the identified weaknesses more specifically in determining the hidden questions and operations to be used.

a.) More word problems with hidden questions were provided and how to determine hidden questions was fully explained.

b.) Regular testing were made to determine the progress of the children and

c.) Each child was taught how to assess his progress through the use of graphical presentation.

To enlist the support of parents quarterly conferences were conducted to discuss their problems and difficulties.

4.0. Effects of the activities that were undertaken to address the identified difficulties of the subject cases.

Based on the activities that were undertaken, the Grade VI pupils were undertaken a Post-test to determine whether there is a progress in their performance, it is obvious that the Mean is 12.53 with a Mean Percentage Score of 83.54 percent, this is greater than 75 percent mastery level. This simply means that activities undertaken are effective on the basis of the increased mastery level.

4.1. Significant difference in the achievement of the Grade VI pupils before and after the activities have been undertaken.

Based on the different activities undertaken before and after the testing, it is clear that the mean difference is 6.97 in multiplication and 8.42 for division, statistical analysis is with the use of the t-test whose level of significance has set at .05, the computed t-value is 46.47 which went beyond 1.671, a minimum required value for significance. Hence, the acceptance of the research hypothesis this simply means that the significance increase

in the mean achievement of the Grade VI pupils can be attributed to the activities that were undertaken to develop the problem solving skills of the Grade VI pupils in multiplication and division of quadrilaterals.

CONCLUSIONS

Based on the findings of this research, the following conclusions are drawn:

1. Provision of adequate vocabulary, adequate exercises will improve the academic performance of the pupils in mathematics.

2. Peer teaching, close supervision and use of instructional materials such as activity cards will help improve the academic performance of the pupils.

3. The involvement of parents is vital in the improvement of academic performance.

RECOMMENDATIONS

Based on the findings and the conclusions drawn, the following recommendations were offered.

1. Other mathematics teachers in other districts shall adapt the activities that were undertaken to improve the performance of children in mathematics as implemented and discussed in this study.

2. Strict monitoring, supervision and evaluation shall be continuous to determine the effect of the activities that were taken.

3. Wider study on this particular scope and area shall be undertaken as a follow-up in this study.

Appendix A

LETTER TO THE PRINCIPAL
ASKING PERMISSION TO CONDUCT THE STUDY

Department of E
Region I
Pangasinan II D
Sto. Tomas District
SAN JOSE ELEMENTARY SCHOOL
Sto. Tomas, Pangasinan

January 16, 2014

MR. SANTIAGO C. TAMONDONG
PRINCIPAL II
SAN JOSE ELEMENTARY SCHOOL
STO. TOMAS, PANGASINAN

Sir,

I have the honor to request permission to conduct an Action Research entitled**"Developing Skills of Grade Six Pupils in Finding Areas of Quadrilaterals"**, in our school for this school year 2014-2015.

This Action Research aims to find out the difficulties met by the Grade VI pupils in word problem solving in Mathematics particularly in finding areas of Quadrilaterals so as to improve their skills.

Hoping for your favorable action on this matter.

Thank you very much.

Very truly yours,

FORTUNATO A. NARIZ II
Researcher

Appendix B

PRE-TEST AND POST-TEST IN MATHEMATICS VI

PROBLEM SOLVING IN FINDING THE AREAS USING MULTIPLICATION AND DIVISION

Direction: Read and answer the questions below.

1. The city's pool is 12 feet by 18 feet. What size cover will they ned for it in the rainy season?

a. Should you multiply or divide?
b. Write the mathematical sentence for the problem.
c. Find the answer.

2. The class painted a 56 square foot mural on a gym wall. It is 7 feet high. How wide is it?

a. Should you multiply or divide?
b. Write the mathematical sentence for the problem.
c. Find the answer.

3. How many square inches of felt paper will it take to cover the top of a game table that is 3 ft. 2 in. by 3 ft. 10 in.?

a. Should you multiply or divide?

b. Write the mathematical sentence for the problem.
c. Find the answer.

4. How many 1 inch square tile will it take to cover a table top that is 2 feet by 5 feet?
a. Should you multiply or divide?
b. Write the mathematical sentence for the problem.
c. Find the answer.

5. One box of grass seed covers 50 square meters. Mr. Fortune's yard is 30 meters by 45 meters. How many boxes of seed does he need?

a. Should you multiply or divide?
b. Write the mathematical sentence for the problem.
c. Find the answer
6. A desk top is 4,800 square centimeters. It is 80 centimeters long, How wide is it?

a. Should you multiply or divide?
b. Write the mathematical sentence for the problem.
c. Find the answer.

7. The Nariz' are buying new floor covering for their kitchen. The kitchen floor is 12 feet by 10 feet. How many square feet of floor covering will they need?

a. Should you multiply or divide?
b. Write the mathematical sentence for the problem.
c. Find the answer.

8. The area of Ping pong table is 45 square feet. The table is 9 feet long. How wide is the table?

a. Should you multiply or divide?
b. Write the mathematical sentence for the problem.
c. Find the answer.

9. One side of the roof is in shape of a trapezoid. The upper base is 16 meters while the lower base is 20 meters. The height ids 4 meters. What is its area?

a. Should you multiply or divide?
b. Write the mathematical sentence for the problem.
c. Find the answer.

10. A garden in the shape of a parallelogram has a base of 16 m. long and a height of 10 m. what is the area?

a. Should you multiply or divide?
b. Write the mathematical sentence for the problem.
c. Find the answer.

Appendix C

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CURRICULUM VITAE'

I. Personal Information

Name: FORTUNATO A. NARIZ II

Address: 49 San Jose, Sto. Tomas, Pangasinan

Birthdate: February 23, 1974

Birthplace: Bambang, Nueva Vizcaya

Civil Status: Married

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Angelina B. Nariz (Deceased)

Wife: Analyn O. Nariz

Sons: Patrick Manuel O. Nariz
Lyfe O. Nariz

Brothers: Cornelio, Edilberto

Sisters: Amelie, Betty, Delia

II. Educational Background

Bachelor's Degree St. Mary's University
Bayombong, Nueva Vizcaya
Bachelor of Elementary Education

March 1993

Secondary	Kalinga Christian Learning Center Tabuk, Kalinga March 1989
Elementary	Bulanao Central School Tabuk, Kalinga March 1985

III. Eligibilities

Professional Board Examination for Teachers
May 1993

IV. Work Experiences

August 23, 2021 up to present	Elementary Teacher Dunseith Public School North Dakota, USA
August 8, 2016 to July 30, 2021	University Instructor Pangasinan State University Pangasinan, Philippines
September 8, 2009 to November 2014	Master Teacher I San Jose Elementary School Sto. Tomas, Pangasinan
February 26, 2003 to September 7, 2009	Teacher II San Jose Elementary School Sto. Tomas, Pangasinan
July 26, 1999 to February 25, 2003	Teacher I Doña Aurea Elementary School Sto. Tomas, Pangasinan
July 25, 1995 to January 22, 196	Substitute Teacher Banggot Elementary School Bambang, Nueva Vizcaya