BIBLIOGRAPHY

WUZHEN SHU, April 2006. *Teaching Mathematics Among Selected Public Schools In La Trinidad, Benguet, Philippines and Huai Hua City, Hunan, China: A Comparative Study*. Benguet State University, La Trinidad, Benguet.

Adviser: Percyveranda A. Lubrica, Ph.D.

ABSTRACT

This study aimed to determine the socio-economic profile of Mathematics teachers and grade VI pupils in the selected schools; to evaluate the extent of use of teaching approaches and methods in Mathematics; to determine the extent of providing activities to pupils in learning Mathematics; to identify the area of need of teachers to improve their teaching Mathematics; to determine the performance of students in Mathematics; to identify the specific area in Mathematics that the grade VI pupils are competent in; and to determine the relationship between the socio-economic profile of teachers and the extent of use of methods in teaching mathematics, teaching approach, extent of provision of activities in learning Mathematics, and degree of needs for improving their teaching.

Findings show that the great majority of Mathematics teachers range in age from 21 to 40 years in the four schools. The teachers are dominantly females. Almost all of them are bachelor's degree holders, and have been teaching for six to ten years. Their salary range from PhP 8,000 to above PhP 18,000.

The grade six pupils range in age from 11 to 12 years. Females dominate the males in the four schools . Most of their parents have blue or white collar job.

The teaching approaches frequently used are discovery, conceptual, process and unified. The process and conceptual approach is most frequently at BSU, an the unified approach is frequently used in the other three schools.

Varied teaching methods are used by teachers in teaching Mathematics. Most frequently used at BSU Elementary Laboratory School are activity method, inductive method and problem-solving method; at La Trinidad Central School are discussion, investigatory, integrated, problem-solving, and modular; at Ying Feng Road Elementary School are reporting, activity and investigatory; and at Xing Guang Elementary Laboratory School are those methods which are frequently of use in teaching Mathematics.

The teachers provide varied activities during the teaching learning process in Mathematics. However, Ying Feng Road Elementary School (YFRES) showed a very frequent provision of the activities in teaching Mathematics. The leading activity is practice and drill, followed by giving quizzes. The use of traditional form of evaluation through a pencil-and-paper test is very common to all teachers.

The Mathematics teachers of BSU Elementary Laboratory School feel that to improve their teaching in Mathematics, they should attend in-service trainings and seminars, make modules, conduct action research, update current strategies, improvise teaching aids, use modern technology and use other textbooks. Those in La Trinidad Central School feel that they have fewer needs to improve their teaching in Mathematics. Those in Yin Feng Road Elementary School feel that they need to attend in-service

training and seminars, update of current strategies and improvise teaching aids. Those in Xing Guang Elementary Laboratory School feel the need to improve teaching aids and update current strategies in teaching.

The pupils in Ying Feng Road Elementary School have the highest performance in Mathematics, followed by those at Xing Guang Elementary Laboratory School, La Trinidad Central School and BSU Elementary Laboratory School. La Trinidad Central School have more low performing pupils. Conversely, BSU Elementary Laboratory School, Ying Feng Road Elementary School and Xing Guang Elementary Laboratory School have high performing group of pupils. The pupils are competent in addition of whole numbers and decimal numbers, and least competent in division of whole number. In using the same mathematical operation in fractions, all the pupils are most proficient in multiplication and least proficient for division. In using the fundamental operations in word problems, the pupils are more competent in solving problems using subtraction and division than in using addition and multiplication. The pupils are proficient in transforming a number to percent and have shown competence in all the other areas but have not surpassed the acceptable criterion.

Age significantly and negatively relates to the use of methods, teaching approach and provision of activities; and gender significantly and negatively relates to the use of methods and approaches, provision of activities and areas needed to improve teaching of teachers. Years in service significantly and negatively relates to frequency of use of teaching methods and approaches in LTCS and BSU, activities in YFRES and XGELS; and degree of need in improving teaching Mathematics in BSU and XG Elementary Laboratory School.

Educational qualification significantly affects the teachers' extent of use of methods and approach in teaching and provision of activities. Salary significantly relates to use of methods and approaches in some schools except for BSU.

Based on the results, the following conclusions are drawn: All the teaching approaches are used in teaching Mathematics but the schools significantly vary in the extent of use of the teaching approaches used in teaching Mathematics. Most applicable among teachers is the use of unified approach where they use the student vocabulary in the presentation of a topic in Mathematics. Relevant and concrete examples are needed in the teaching of Mathematics.

The teachers do not significantly vary in the extent of use of the teaching methods in Mathematics. Differences in the extent of use of the method is likewise observed among the four schools.

The teachers are proficient in the use of the methods except for reporting. This shows that teachers promote the collaborative or cooperative learning in Mathematics.

Enhancement activities are provided but not frequently. Mastery learning is not much an emphasized in the teaching of Mathematics in the two schools in Mathematics as manifested by the low extent of providing the activity.

There is a need to increase more time for teachers to spend in classroom teaching for Mathematics. Textbooks are scarce and teachers lack research skills in all schools.

There is a need for pupils in all the schools to enhance their competencies using the four fundamental operations in Mathematics and other areas of learning. Age, gender, highest educational attainment and salary received by teachers are significantly and

negatively related to the extent of use of teaching methods and approaches and provision of activities to pupils in learning Mathematics.

TABLE OF CONTENTS

INTRODUCTION

Background of the Study

Knowledge not land or capital is the most valuable human resource in the emerging information age. Thus, schools around the world of whatever nature are pushing forward towards excellence, a means for a country to achieve industrialization, which is enjoyed by several western countries and a fraction of Asian nations.

Since Mathematics is a part of the school curriculum and one of the pre-requisites in fulfilling the requirements of every educational system, it must be the focal point of every government in the world. Mathematics is the basis of all subjects. There are no natural sciences or social sciences to speak of without Mathematics application. Unfortunately a lot of poor scenarios have been observed by some educators and researchers. Students face big problems and difficulties in dealing with the Mathematics. A a result, they develop a phobia or dyscalculia of mathematical or arithmetic concept and experience difficulty in performing Mathematics calculations. In many instances, a child or pupil would carry on this kind of disability for the rest of his/her life and would never overcome it.

In China, many elementary schools have pupils experiencing difficulties in studying Mathematics. Pupils easily forget and sometimes get confused in computing or using different kinds of formulas. Hence, most of the pupils spend a great deal of time studying the said subject.

The educational system is also one of the problems of China. Although progress is on its way, the system creates some loopholes. For instance, teachers are not given the leeway to make the subject matter more interesting because of the regulation that the

teaching contents of all schools should be followed with the same format, same teaching plans, and teaching procedures in one specific subject matter. Secondly, books are required to be covered from first to last page. Thus, this study.

Statement of the Problem

This study particularly compared the teaching of Mathematics among elementary grade VI Pupils in selected schools in the Philippines and that of China. Specifically, the researcher endeavored to find the answers to the following questions:

1. What is the socio-economic profile of Mathematics teachers and grade VI pupils in the selected schools?

2. What is the extent of use of teaching approaches and methods in Mathematics?

3. What is the extent of providing activities to pupils in learning Mathematics?

4. Which area in Mathematics should teachers need to improve?

5. What is the performance of students in Mathematics?

6. In what areas are the grade VI pupils competent in Mathematics?

7. What is the relationship between the socio-economic profile of teachers and

   a. the extent of use of methods in teaching mathematics,

   b. Teaching approach,

   c. Extent of provision of activities in learning Mathematics, and

   d. Needs for improving their teaching?

Objectives of the Study

The main purpose was to compare the status of teaching Mathematics in selected schools in the Philippines and China. The specific objectives of the study are the following:

1. To determine the socio-economic profile of Mathematics teachers and grade VI pupils in the selected schools.

2. To evaluate the extent of use of teaching approaches and methods in Mathematics.

3. To determine the extent of providing activities to pupils in learning Mathematics.

4. To identify the areas that need improvement in the teaching of Mathematics.

5. To determine the performance of students in Mathematics.

6. To identify the specific areas in Mathematics that the grade VI pupils are competent in their learning.

7. To determine the relationship between the socio-economic profile of teachers and

   a. the extent of use of methods in teaching mathematics,

   b. Teaching approach,

   c. Extent of provision of activities in learning Mathematics,

   d. degree of needs for improving their teaching.

Importance of the Study

The product of this study will benefit first and foremost the four selected schools. It gives ideas of how teachers can integrate the changes and other technical aspects of education necessary in the improvement of the educational curriculum and system. It gives them pointers on how to facilitate learning in Mathematics and make pupils competitive. School administrators can be guided as they continue of improve the quality of education as they see the feedback in regard to academic performance of pupils and to competencies of their teachers. Teachers may get some ideas and other concepts on how they can improve themselves and their craft, and on how to be effective inside and outside the school and classroom. Guidance counselors may also gain an advantage in this study. They can be enlightened of the problem regarding study habits and Mathematics phobias and other related disability. Eventually, they come up with some programs and services that could help students in overcoming such problems.

Most importantly , this study would help the researcher improve her teaching in all aspects of teaching Mathematics. She can gain an insight into when and how to use new and effective educational technology. Finally, she can gain knowledge of how to adjust to the diverse personalities of students and thus to modify her own personal attitude and personality so that she can generate a general interest of the pupils in learning Mathematics.

Scope and Delimitation of the Study

This study centers on the identification and comparison of teacher-related, pupil-related, and learning-related factors that have a high significance to or influence on the

mathematical performance of the pupils of selected public schools in Huai Hua City and La Trinidad, Benguet. Included in the study are only grade six pupils who are currently enrolled and their teachers.

Pupil-related factors include pupils' personal profile according to age, sex, and parents' occupation, including perspective and attitude of pupils toward Mathematics. Learning-related factors focus on the mental ability level of pupils sampled in the four phases of learning, namely, acquisition, mastery, generalization, and maintenance. Classroom management related to timetable or distribution of time spent in learning concepts and theories and to activities given by the teacher is considered. Teacher-related factors zero in on how teachers use materials in teaching Mathematics effectively, approaches and techniques used in processing problem solving and other arithmetic operations; and on the activities that the pupils are doing during Mathematics classes in order to understand the concepts and theories and their application. The most important thing in the educational system, the Mathematics curriculum is also included.

REVIEW OF LITERATURE

Socio-economic Profile of Respondents

Professional Profile of Teachers

It is an accepted fact that the quality of education depends to a large extent on the quality of teachers. The professional profile of the teacher is an indicator of the standard of education in a country.

The quality of education is said to be dependent upon the quality of teachers, supervisors and administrators that the system employs (Guerrero, 1989). One of the measures of the quality of teachers and administrators is their academic and their professional training. Their academic and professional training is reflected on their educational attainment, field of specialization, number of years of teaching and participation to seminars and workshops relative to the improvement of instruction (Lubrica,1996).

The question on the professional profile of teachers has been the subject of many investigations and discussions for the past many years. Researchers looked into the different aspects of educational program with the aim in view of bringing out what needs to be done to improve the system. The following are some pertinent studies that are related to the present investigation (Lubrica,1996)

Toledo (1982) conducted a research among Mathematics teachers of Benguet State University and found that Mathematics has not advanced professionally. The same finding was gathered by Ocampo (1987) with the implementation of the Performance

Appraisal System for teachers. Ocampo also found that secondary teachers pursued their professional advancement by earning some M.S units.

Profile of Pupils

According to Madali (1979), several factors have been identified to play significant roles in the achievement of students in Mathematics. Among these factors are heredity, environment and past achievements. This is also seconded by Sorenson (1979) who revealed that sex had something to do with attitude toward certain subjects. However, Santos (1980) made a comparative study of the mathematical abilities of boys and girls to find out whether sex is a determining factor in the differences in mathematical abilities of boys and girls; whether the intelligence of an individual affects his or her ability to understand the mathematical principles; and to discover other factors that directly cause or affect the differences in mathematical abilities. It was found that sex does not affect the differences in mathematical abilities; that the intelligence of an individual does not affect his ability to understand the mathematical principles; and that some of the other factors that directly cause or affect the differences in mathematical abilities were lack of textbooks, lack of extensive drill work, absence of remedial teaching, lack of interest on the part of the teacher and inability of the students to comprehend and understand the different problems in Mathematics.

Teaching Approaches / Methods

Salandanan, Santos, and Diaz (1988) mentioned two problems that a mathematics teacher has to deal with. First is to provide his mathematical experiences suitable to the state of development of their existing concept and to fit his method of presentation to the

pupil's concrete or formal level of thinking. The second is to develop the pupil's ability to analyze new material himself so that he can synthesize his own concepts in ways most meaningful for him independently. They further added that to solve these problems in ways that will meet the needs of the learners, the teacher needs to know and to use different teaching strategies.

Furthermore, the teacher needs to do the following to execute lesson in Mathematics successfully: manage his classroom efficiently and with minimum disruptions; elicit active participation from his student; recognize and solve students' learning difficulties (inability to read at grade level, physical handicaps, emotional problems, low skill level, etc.); communicate Mathematical concepts precisely in the proper inductive sequence, at a level consistent with the children's abilities; adapt the pace and direction of instruction to the group he is teaching; provide an atmosphere where mistakes are accepted as a part of learning and where students feel free to ask question when they do not understand a concept; motivate students to want to learn mathematics; develop in students positive attitudes toward mathematics; and select and use methods appropriate for given behavioral objectives and concepts.

Lardizabal et al. (1991) stated that practices have gradually replaced undesirable features of so-called lesson-hearing procedures. This is due in part to the gradual acceptance of the newer philosophy of education, i.e., education is not merely a process of learning facts and storing knowledge, but it is conceded with the social, emotional, and mental development of the individual.

Including the ability to meet social needs they further added that before taking up

specific techniques for organizing classroom activities, it is best to consider first the social needs of pupils and students in planning classroom experiences which can be expressed in terms of abilities required to satisfy them.

Moreover, they mentioned that not every class can provide activities that will contribute to the realization of all the preceding outcomes but many activities can contribute to the realization if they are handled in the right way. The result will be a greater range of pupil participation in learning experiences. With this perspective, the teacher should understand the need for different methods of organizing classroom activities and the need to make a wise choice of the types of activities that should be used under varying conditions. They mentioned the following approaches and techniques which can be used in teaching: the integrative technique, the discovery approach, the process approach, the conceptual approach, mastery learning, programmed instruction team teaching, simulation, module, etc.

In China, the teacher fulfills his teaching tasks using styles/techniques or strategies which includes teacher-teaching methods and student-learning methods. Teaching and learning is a bilateral activity so in order for the teacher to fulfill his teaching tasks, there should be concrete methods and measures to attain the objectives of teaching-learning process.

Mathematics teacher should have a broad systematic understanding of the main teaching methods so that he can teach according to the concrete teaching content.

Generally, teaching methods in Mathematics are classified as the traditional and the modern. Traditional teaching method includes explanatory method where the teachers

teach through systematic narration. The teachers reading and oral communication to transmit knowledge characterize it. This method is guided by the scientific, systematic, enlightenment, artistic, and emotion principles.

Lecture method is a traditional method. The teacher is tasked to ask questions to the students and at the same time he expects some feedbacks from the students. It is through this method that the reasoning and expression of ideas of the students are developed. For this method to be effective, the teacher must carefully decide on what questions to ask, from easy to difficult. The questions should be enlightening and on the level of the students. Lastly, he should be able to summarize the lesson.

The show or demonstration method falls under traditional method too. Here, visual materials are shown to students to explain the lesson. Discussion, on the other hand, encourages the students to discuss among themselves and ask question for the teacher to answer. Meanwhile, the Reformed Chinese Educational Method or the modern method includes several teaching methods in Mathematics such as self-study, unit method, drills, and exercises and other methods used by foreign countries such as the programmed instruction, example, and discovery method.

Caet (1979) attempted to appraise the instruction of elementary Mathematics in the Division of Pagaduan City during SY 1978-1979. The study dealt specifically on such areas as the attitudes of teachers towards professional growth; the extent of making use of instructional materials; methods and technique of teaching and evaluative instrument to make instructions effective. The respondents of the study were 232 teachers of the Division of Pagaduan City who taught elementary Mathematics. The findings are

summarized as follows:

1. The majority of the teachers teaching elementary Mathematics were academically prepared and educationally qualified to teach the subject.

2. All teachers were often and always interested to teach the subject; they had the right attitude towards professional growth, reflecting this attitude by attending in-service training, reading professional books and magazines, attending summer and Saturday classes and some even went to the extent of taking educational leave of absence.

3. More than three-fourths of the teachers always used prescribed textbooks, supplementary materials, teaching guides, manuals, workbooks and magazines to make their Mathematics instruction effective.

4. The majority of the teachers such as self activity, discovery, project method and others.

5. Most of the teachers always used mastery learning and discussion techniques.

6. Almost all the Mathematics teachers evaluated the outcomes support of their objectives using the criterion-referenced measures.

7. The Mathematics teachers were given enough supervisory support for improvement from the Principals and the Division Mathematics supervisor through regular visits and observations.

Salamonis (1970) suggested three central factors that would contribute to successful teaching and would likewise affect the effective implementation of the curriculum. These factors are as follows: teacher's knowledge of the subject matter, teacher's knowledge of the learning theory, and teacher's knowledge of techniques and

strategies.

It was also explained that the teacher should have a sound background in the subject matter and related areas, and a willingness to learn more. Along with the knowledge of the learning theory, the teacher should know who are being taught and should be familiar with all the aspects of learning. Such aspects must be recognized when they arise in the classroom and must be known how to utilize in the service of education. In line with the knowledge-teaching techniques and strategies, the teacher must be able to analyze what is required in the situations and to select the most suitable techniques and strategies.

In order to determine the effectiveness of a teacher, an evaluation of teacher's performance is a necessity. The evaluation of teaching, as viewed by Rivera and Sambrano (1982), aims to promote the growth and development of the teacher by means of an analysis of the criteria of good teaching. It should help the teachers discover and understand their strengths and weaknesses so that they can utilize their assets to a great degree and correct their defects. More specifically, the evaluation of teaching aims to find out the effectiveness of activities and experiences designed to help teachers formulate a sound philosophy of education which relates to the roles of the teacher, the school and other educational agencies in modern society and to understand the status, ethics and organization of the teaching profession.

Within the area of teaching strategies, Alcorn (1964) said that the lecture method can be functional only when it is correctly used, such as in explaining the problem, illustrating or demonstrating a process or a point, telling a story, or introducing a new

lesson. Other than that, the teacher should stimulate creative thinking among his students. The teacher should foster students' participation.

One does not learn by wholly listening. There is therefore a need for other teaching techniques to illicit the active participation.

The task toward the effective implementation of the curriculum is through effective teaching. Alcorn (1964) presented five strategies to effective teaching, as follows: individual teacher effort; in-service education; planned service of supervision; experimentation and research; and evaluation and accountability system.

These strategies, if properly installed, implemented and strengthened, will make a good school in general and effective teaching in particular. The implementation depends upon the competence of the school administrators and supervisors as well as the dedication and cooperation of the teaching staff and other school personnel.

Tating (1993) said that the teacher occupies a most important place in modern society. He is linked between industrial society and the educational system. He must possess a thorough knowledge of his field and must have some experience in the world for which he is preparing his students.

Borich (1992), as cited by Elliot et al. (2000), characterized effective teachers as possessing five key behaviors: lesson clarity, instructional variety, task orientation, and engagement in the learning process, and student success. Lesson clarity refers to how clear the teacher makes his presentation to class. Instructional variety means that the teacher's teaching techniques remain flexible during the presentation of the lesson. Task orientation and engagement in the learning process refer to the time spent in learning

academic subjects. Berliner (1988), as cited by Elliot et al. (2000), stated that when students' academic learning time is increased, their achievement improves. Success rate means the rate at which students understand and correctly complete their work.

Theories have been developed that include integrated approach to teaching and learning, and commitment and understanding from the whole community (Drake, 1998; Fleming, 1993; Stephens, 1991). Levak et al. (1993) claimed that flexibility which allows teachers to utilize alternative approaches across disciplines, instead of forcing connections where connections do not exist, seems to engender success.

Klein and Doty (1994) promoted models and structures related to teaching approaches and this is related to interdisciplinary learning, which is proliferating . These are based on active learning strategies that promote higher- order-critical-thinking skills (defined as analysis, synthesis, application and evaluation). These methods include collaborative / cooperative, learning discovery and problem- based learning.

Learning Activities in Mathematics

Serion (1980) pointed out that the pupils dislike Mathematics and its related fields, and this attitude must have been due to the influence of frustrated elders.

Aside from the effect of the school and the parents, attitudes also develop from suggestions. Hence, it is necessary that the pupils' positive attitude toward Mathematics should be developed early. It is because the most difficult attitudes to change are those rooted in fears or highly personal emotional needs. With fears and prejudices, proper attitudes towards Mathematics are not developed in children (Alken, 1970).

Mazon (1982) made a study on the difficulties of sixth grade pupils in problem

solving in arithmetic through diagnostic teaching and found the following outstanding causes of errors in the sixth grade: the pupils failed to understand the problem in whole or in part; they were poor in silent reading; they lacked the knowledge of terms; they lacked the necessary experience to reproduce the situation in the problem; they lacked the ability to know the meaning and relations of some of the different quantities used in functional arithmetic; they lacked the ability to identify the proper processes of operations; and they lacked the ability to perform accurately the fundamental processes.

Furthermore, Dantis (1982), discovered the important factors conducive to the teaching of Mathematics that school administrators may use in the improvement of instruction. Respondents were 214 fourth year high school students of three private sectarian schools in San Jose, Occidental Mindoro. It was recommended that Mathematics teachers should do away with the common attitude that girls are not as capable as boys in Mathematics and, therefore, no discrimination should be made between them.

Piloten (1983) made a study on the difficulties and attitudes of fourth year high school students regarding Mathematics and found that students had difficulty in Arithmetic, Algebra, Geometry and Trigonometry because of the following reasons: the students do not have enough textbooks; the students can not understand the teachers' explanation; the teachers cover the lesson too fast; the students are not given the opportunity to ask questions; and the teachers lack explanations.

Nevertheless, if the students are actively engaged in and enjoying classroom activities it makes little differences if the teacher is lecturing, using discovery technique,

or using small-group activities for independent study. Brophy and Good (1978) claimed that what is important in maintaining classroom atmosphere is how the teacher manages the classroom, especially how he keeps the class actively attentive to lessons and be involved in productive activities.

According to Jenson (1998), the best way to grow a better brain is through challenging problem solving. This creates new dendritic connections that allow even more connections. This is a result of spawning a dynamic philosophy referred to as "constructivism", which refers to students in constructing new knowledge. Barab and Landa (1997) supported this by indicating that students must focus on problems worth solving to increase their motivation and learning capacity. Austin, Hirstein and Walen (1997) added that this results to greater intellectual curiosity, improved attitude towards schooling, enhanced problem-solving skills, and higher achievement in college. One of the best ways to promote problem solving is through an enriched environment that makes connections among several disciplines (Wolf and Brandt, 1998).

Level of Competencies in Different Areas in Mathematics

Carino (1992) cited statistics which showed that education in many places of the world is in crisis. The said statistics revealed that millions of children and youth satisfy the attendance requirement but do not acquire the essential knowledge and skills for functional daily living.

"The foundation of every state is the education of its youth." This is according to former Philippine DepEd secretary Florencio Abad. who added that the failure of

education represents the failure of society. Furthermore, he reported that there is a crisis in Philippine education and said that the 2004 High School Readiness Test, only 0.64 percent scored 75 percent or better, that is, 8,000 students out of 1.2 million examinees. In the latest Trends in International Mathematics and Science Study, out of 38 countries, Philippines placed third to the last, that is 36th place in a field of 38[1].

Dyscalculia is one of the reasons why in the recent statistics found recently, Philippines ranked 3rd from the bottom among 54 countries in the international mathematics for 13-year-old children. The country ranked lowest in the Asian region for the same test. Moreover, high school students answered only 50 percent of the national achievement test. As a manifestation, the results of the Third International Mathematics and Science Study-Report disclosed the dismal performance of students in the two subjects as compared to their international counterpart. This study was released last March 9, 2001[2].

Mapandol (1980) found that children are most deficient in solving problems involving whole numbers and rational numbers, percentages and measurements and applying principles, rules and generalizations in solving problems about perimeter and area, and on making quantitative comparisons.

In the study made by Bawang (1995), she found cited Vergara's study showing that students were very weak in Mathematical computation skills, have difficulty in interpretation are unable to understand the problems, and fail to represent the given facts or conditions and unknown quantities and interpret verbal statements to mathematical forms.

These problems of students regarding numbers stem from memory deficit. Memorization is necessary since mathematics requires a set of procedures that must be followed in a sequential manner. Those experiencing difficulty remembering things will have difficulty remembering order of operations to be followed or the specific sequence of steps to be taken to solve mathematics problem. Also, it is observed that negative experiences in the past are often due to lack of confidence and that a positive attitude leads to a better performance.

The Philippines is trying to go beyond the horizon. One hundred Filipino elementary pupils compete in the Philippine Elementary Mathematics International Contest and Asian Inter-cities Teenagers Math Olympiad at Bohol Tropics Hotel, Tagbilaran City, Bohol. These pupils underwent rigid training by the mathematics trainers Guild of the Philippines. This was successfully done because of the donation given by Jose Miguel Arroyo, husband of the President, which cost P1 million to stage the contest and in cooperation with the Department of Science and Technology Education Institute and the Department of Education

What subject matter should be taught and how long should a teacher teach it affects the teaching-learning situation. The daily period in Mathematics in Grades I, II, and III includes a study of the four fundamental operations, fractions, metric and local measures, the use of money and their application to practical problems based on activities of real life. In grades IV, V, and VI, the child is expected to conceptualize the meaning of ratio and proportion, angles, plans, and spatial figures of scales, maps, and graphs. Besides further development of the basic Mathematical skills, the child is expected to

solve problems related to business and industrial activities in the community.

Vergara further added that the daily periods of 40-minutes in grades I to IV shall be scheduled in the daily class program as one whole block. For example, 40 minutes, or this may be divided into two periods, in grades I and II, a 20-minute period in the morning, and a 20-minute period in the afternoon.

There are several problems encountered in teaching Mathematics that can be attributed to different reasons. Computational weakness is one. Many students, despite a good understanding of mathematical concepts, are inconsistent at computing. They make errors because they misread signs or carry numbers incorrectly, or may not write numerals clearly enough or in the correct column. These students often struggle specially in primary school, where basic computation and "right answers" are stressed. Often they end up in remedial classes, even though they might have a high potential for higher –level Mathematical thinking.

Another one is the difficulty in transferring knowledge. One fairly common difficulty experienced by people with Mathematical problems is the inability to easily connect the abstract or conceptual aspects of Mathematics with reality. Understanding what symbols represent in the physical world is important to how well and how easily a child will remember a concept. The students, on the other hand, should develop making connections. Some students have difficulty making meaningful connections within and across mathematical experiences

For some students, a mathematical disability is driven by problems with language. These children may also experience difficulty with reading, writing, and speaking, In

mathematics, however, their language problem is confounded by the inherently difficult terminology, some of which they hear nowhere outside of the mathematics classroom. These students have difficulty understanding written or verbal directions or explanations, and find word problems especially difficult to translate.

A far less common problem-and probably the most severe-is the inability to effectively visualize mathematics concepts. Students who have this problem may be unable to judge relative size among three dissimilar objects. This disorder has obvious disadvantages, as it requires that a student rely almost entirely on rote memorization of verbal or written descriptions of mathematics concepts that most people take for granted. Some mathematical problems also require students to combine higher-order cognition with perceptual skills; for instance, to determine what shape will result when a complex 3-D figure is rotated.

Moreover, Dela Cruz (1992) noted the following as causes of difficulties in problem solving: physical and mental defects, reading and arithmetic vocabulary interests, lack of variety in problem solving experience, lack of method of attacking the problems, and lack of skills in fundamentals

Barsaga (1995), after identifying poverty as one of the major factors affecting the teaching-learning process, professed that this is a closely related variable and that one who is poor, for example, is likely to have parents who are poorly educated and illiterate and with little interest in schooling. Since the family is poor, he is most likely to be relied upon to help his parents do household chores and to engage in child labor in order to augment the family's income. He therefore absents from class more frequently than the

other pupils who are better-off. Because of his irregular attendance in class, he is likely to lag behind in academic achievement.

Another factor which might be attributed to performance of pupils in learning Mathematics is teacher competence. A study made by Sta. Maria (1972) discovered that elementary teachers were deficient in the following areas which are ranked according to difficulty: graphing, mapping, scaling; numbers and numerals; addition and subtraction; geometry; multiplication and division; ratio, proportion and percentage; and, set and set operations.

In a separate survey on teachers competence in Iligan City by Sister Coronel (1981), the president of the Mathematical Society of the Philippines, it was discovered that the teacher-respondents perceived that the pre-service Mathematics teaching that they acquired was inadequate for them to teach the subject with competence. They indicated that insufficient preparation is due to inadequate Mathematics courses in the pre-service training. Most schools offer only six units of Mathematics to prospective elementary Mathematics teachers.

The results confirmed what has been believed all along in teaching that the teacher is the key factor in student achievement. The study also revealed that those pupils who behave well, showed positive values and were delegated with responsibilities, achieved higher scores than those otherwise.

The study found that high-achieving schools were those whose teachers were competent, had quality boardwork, could communicate and interact well with their pupils, used many instructional aids, and were able to maintain a classroom atmosphere

conducive to learning. Finally, the role of the library in complementing classroomlearning cannot be overemphasized.

Relationship Between Variables

Aglano (2002), a Mathematics teacher at Benguet State University Laboratory High school, Benguet, Philippines made a thesis on Mathematics anxiety and its relationship to the profile of the University of Baguio Science High School students, which gave a definite concept for teachers to efficiently deal with the difficulties and anxieties of students in the subject. Recommendations included the incorporation in the system of changes in Mathematics grading system by making oral participation 15 percent of the student's grade instead of 10 percent. This motivated students to recite more often, increasing interaction among students and teachers during class discussion.

Oasan (1983) conducted a study on the relationship between NCEE scores ratings in College Algebra with freshmen college students from the University of Baguio as subjects. It was found that: The male students excelled over the female students in two areas of the NCEE, namely, reasoning ability and mathematical ability; the females excelled over the males in verbal ability and reading comprehension; and , The performance in high school Algebra affects the performance in NCEE in the area of mathematical ability.

The study of Ramos (1983) pointed out that anxiety as well as emotional stability and the attitudes of the pupils toward their teachers are the factors that significantly influence academic achievement in Mathematics.

Abubo (1989) found that the greatest factor which is significantly related to the Mathematics achievement of students is professional qualities of teachers.

Pilar (1989) studied the determinants of academic performance of students in Mathematics at Northwestern College, Laoag City and found that the number of preparations and teaching experience of Mathematics teachers were included among the variables with possible effects on the teaching of Mathematics. The respondents of the study were the first and second year college students.

Dinamling (1990) pointed out, after conducting a study on the teaching of elementary Mathematics, that the most serious problems encountered by Mathematics teachers are poor computational skills of pupils and their limited vocabulary to understand and analyze problems. These deficiencies of pupils were magnified among the findings of Marrero (1989) in a study of remedial measures on problem solving in Mathematics IV. Also magnified were the following factors that cause difficulties among students in problem solving as perceived by their teachers: lack of knowledge of mathematical terms, poor vocabulary, lack of interest in Mathematics, and students not like their teachers.

Other Related Studies

According to Japan International Corporation Agency (JICA)[3] expert and Science-Mathematics Education Manpower Development Program (SMEMDP) team leader Kenichi Huira, the students' low achievement and lack of interest in Mathematics are caused by the lack of motivation given to the students. He said that there is a need to

reinforce the inner drive among students to strive for academic excellence if industrialization is the aim of the country.

Although there are very many problems emerging in the educational system, private sectors, companies, the government and non-government organizations are trying to do some researches and new innovations with regard to strategies including the integration of technology as a means of processing mathematics problems. In the California High School Exit Exam, which consists of an English-language arts portion and mathematics portion, students must pass both portions of the test to graduate from California public high schools. The purpose for this kind of system is to look for the growth rate of the 10th graders, said Greg Franklin, Director of Curriculum, Instruction and Assessment for the Glendale United School District. In 2004, only 10th graders took the test compared with this year, when 10th- and 11th- graders who did not pass the first time took the test again. Franklin said that the focus on teaching the standards to all the students and providing additional support and intervention to juniors and seniors who have not passed yet. In addition, President George W. Bush passed a law in 2002 entitled "The No Child Left Behind Act." This is intended to create accountability for results, an emphasis on doing what works based on scientific research; expanded parental options; and local control and flexibility[5].

Another country whose status was also changed since it was founded is China. It made a great progress in mathematics, and made remarkable contributions in complex function, finite element calculation and other fields. It took China 20 years to catch up with the world. Although China still has a large gap with America, France, and Germany

in mathematics , its strength is powerful. Chinese young contestants have successfully won Olympics math gold medals. This happens maybe because 3-5 years old children go to informal schools and learn how to count from 1-20 only, how to pronounce number and how to locate it in the fingers as a means of simple perception. They use also toys in play activities in order for the teachers to let the children have an idea or concept of numbers. Mathematics is already taught at the beginning of the formal schooling in grade 1. As the pupil grows and goes to a higher level, numbers being learned also increase up to 100. Higher mathematics like Geometry is in grade 4, and Algebra and Statistics are taught in the middle school and high school. In the new century, China's mathematics is sure to get faster development. Both domestic and foreign scientists hold that China will become a math power within five years. Contemporary Chinese mathematician Wu Wenju said that in the information era, using computer to conduct all kinds of complicated work instead of human brain is to input algorithm into computer and then computer can automatically calculate according to algorithm[4].

According to China East Normal University Professor Zhu Zhiting's report (2002), on the functioning modes of information technology in classroom instruction:

> Predictable, classroom instruction will still be a major form for school education in a not-short future time. To improve classroom instruction with support of information technology stands for a practical strategy for educational reforms in school. There is a need for us to understand the functioning modes of information technology in classroom instruction and thus we can select and make use of technology reasonably and effectively. This article first identifies the

orientation of instructional reforms in the classroom and creates an action space concerning the use of technology to support this kind of reforms. Based on this, an theoretical framework is a addressed to posit the functioning models of information technology in classroom instruction, in which three modes are suggested: enhancement, innovation, and training. A number of instructional cases in relation to each modes are then studied in order to identify a set of sample models for technology-supported classroom instruction. This article is ended with our suggestions as to how different instructional models and technologies can be integrated into classroom-based instructional process.

Chinese Math researcher, Wen Jie (2005), found that interest is the most active factor for students in learning mathematics, and it is also the most positive factor for learning other subject areas. To improve the student's interest in learning math is the teacher's very important role.

According to Chinese Wen Xin Elementary School Grade I Mathematics teacher Wu Guiti (2006)' knowledge, concept and methods, must be practiced by the students in actual activities. Learners in Mathematics will then understand and grasp the concept while the teacher facilitates it. The actual experiences during the activities will lessen dependence on the teachers.

China Guang Zhou City's Secondary school teacher, Jia Guofu (2006), gave a new Mathematics teaching process. The process is setting a set of questions, pre-test the set of questions to the students, planning the curriculum program based from the questions, carrying out the plan, summing up and re-planning for improvement

His new Mathematics teaching process is intended to develop the student's ability; personality and moral character. Values is also integrated in the mathematics curriculum as part of the process.

Conceptual Framework

The researcher used an observational-comparison approach and sampling technique using questionnaire to gather information and data from the two schools being studied and compared.

The general objective of mathematics in the elementary level as mentioned by Salandanan et al. (1988) is…

> to help the child compute and solve problems relating to occupations, business practices, measurement, estimation, income and expenses, taxes, rental rates and interest charges, gather and interpret data using graphing and scaling, and other matters related to the problems of daily living.

They added that the foregoing general objective aims to develop in the elementary school child the following knowledge/skills: the number relationship of facts and processes, the meaning of the number facts and processes, and application of the number facts and processes to life or lifelike situations.

To achieve the general objectives of a mathematics program they moreover gave assumptions such as:

1. The teaching of mathematics should help the elementary school pupil to develop clear concepts about numbers, numeral, mathematical operations, and the like, for a clear understanding of simple number relationships contributes much towards the

comprehension of the basic structure of mathematics;

2. Mathematics instruction should enable the children to master mathematical knowledge. Modern mathematics in the elementary grades still emphasizes the mastery of certain facts;

3. One of the major purposes of mathematics instruction is to arouse and develop among children the appreciation for mathematics. This appreciation will make them realize how mathematics can be used to solve their own daily problems.

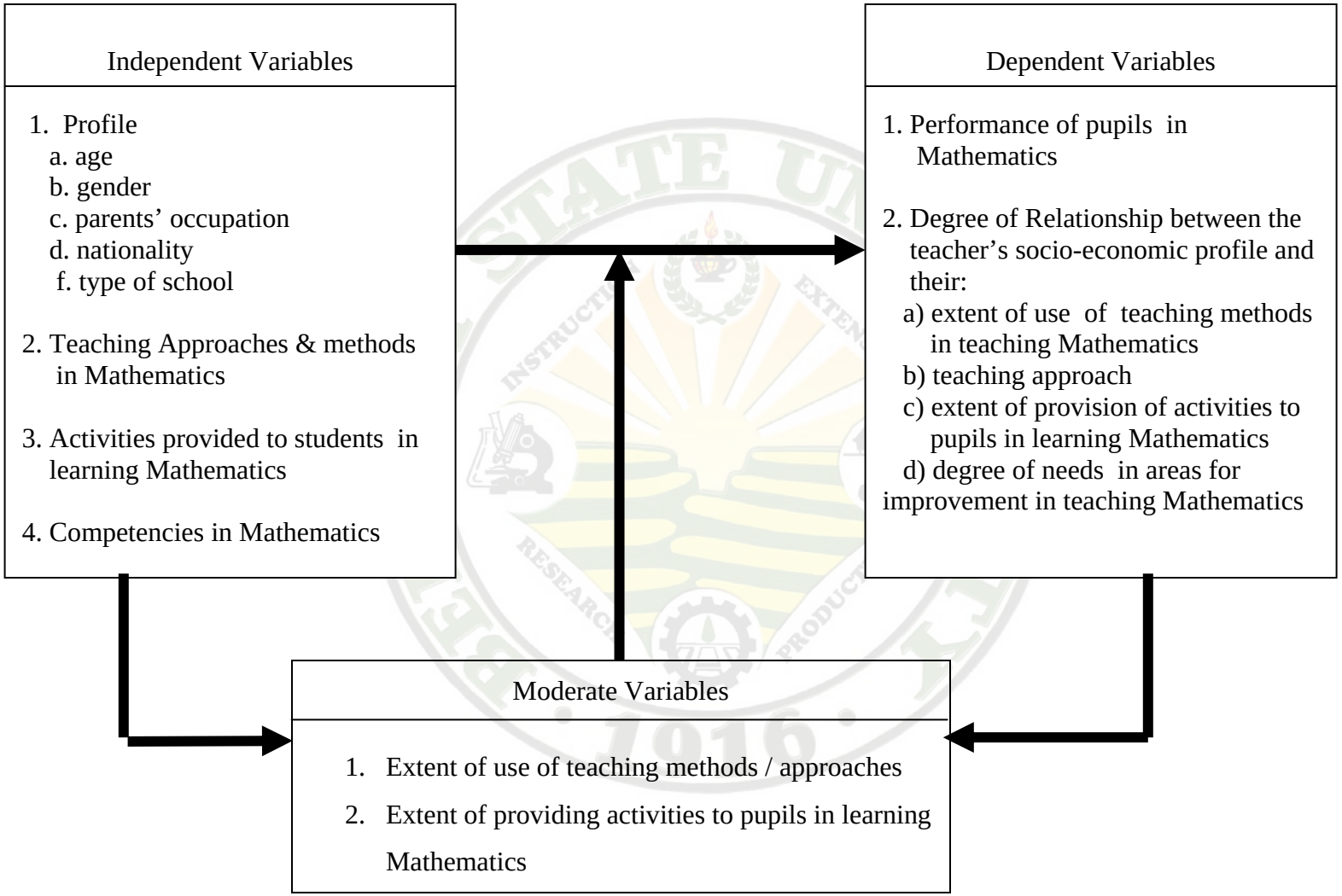


Figure 1. Paradigm of the study

The independent variables that the researcher manipulated were the background information about the pupils, teaching approaches and methods, activities provided to students in learning mathematics, and competence in Mathematics.

Those variables considered to affect the independent and dependent variables were related to the extent of use of teaching approaches and methods in Mathematics and extent of providing activities to pupils in learning Mathematics.

Construed as the output variables are performance of pupils in Mathematics and degree of relationship between: socio-economic profile of teachers and their teaching approaches and methods; socio-economic profile of students and level of competencies; teaching approaches used by teachers; extent of provision of activities in learning Mathematics, and degree of needs for improving their teaching.

Definition of Terms

The following are terms operationally defined for common understanding.

Acquisition Phase. It refers to the phase of learning where students should attain 100% of the objectives. The end product is according to the learners.

Activity Method. It refers to the students are engaged in the activity to have a first hand experience about the concept being learned.

Age. It refers to the respondents time from birth to the period of his study.

Assignment Method. It refers to the students are given interesting homework that requires a little research or participation and assistance from family members.

Board work. It refers to activities such as solving problems using the blackboard.

Competence. This refers to the mathematical competence of pupils based on their ability to use the four fundamental operations dealing with whole numbers, fractions, decimals and worded problems. This also includes mathematical competencies in dealing with ratios, ratio and proportion, transforming a number to percent, identifying shapes of objects, determining measurements of angles and areas of solid objects.

Deductive Method. It refers to the teacher begins teaching from a generalization and subsequently gives examples and specific situations that are supportive of it.

Degree of Need. This is referring to the areas where teachers need to further improve their teaching in Mathematics. These are measured according to degree of need using the scale ranging from very much needed to not needed.

Demonstration Method. It refers to the teacher shows a step by step presentation through concrete actions and materials of which the students will observe.

Discussion Method. It refers to the students are guided to give a free exchange of ideas about a particular topic.

Extent of provision of activities. This refers to the extent the learning activities are provided to students to learn mathematics. This is measured using the scale that range from Very much provided to not provided.

Gender. It refers to the respondents, either male or female.

Generalization phase. It refers to the phase of learning where students are exposed to new problems to construct new ideas.

Grade level. It refers to the pupils grade.

Inductive method. It refers to the students are taught starting from the known to the

unknown; from the specific to the general; from the particular to the universal; from simple to complex; and from the concrete to the abstract.

Integrated Method. It refers to the teacher combines two or more subjects to explain a main topic. One is a springboard and the other is the main topic. Other subject areas could be supportive to the main topic.

Investigatory Method. It refers to the students are required to do an experiment, conduct an investigation, try out different alternatives to solve a given problem.

Lecture Method. It refers to the students are provided with needed information by factual presentation and textual explanation of a particular topic.

Maintenance Phase. It refers to the phase where students review their own learning.

Mastery Phase. It refers to the phase of learning where student manifests expected behavior within a time frame.

Mathematics. It refers to the subject which deals with numbers and their properties, relations, and combinations and spatial shapes and their structure and measurement:

Modular Method. It refers to the students are given a self-contained and independent unit of instruction with specific objectives. The student is given an opportunity to know the specific objectives and do the learning activities by following specific procedures.

Parent's Occupation. It refers to the respondent's work of parents or parent's job.

Performance . This is determined by the scores obtained by the student in a given test. The performance is one of the factors used to describe the group of pupils, their distribution and their characteristics as learners.

Practice and Drill Method. It refers to the students are required to practice and master important prerequisite skills necessary for the whole lesson. Constant review is necessary.

Problem-solving Method. It refers to the teacher sets a good criteria for students to come up with a solution.

Recitation Method. It refers to the students are made to focus on sets of questions which are answered from reading books and other printed materials. They share their insights and answers during the class session.

Reporting Method. It refers to the students are allowed to search for information about a given topic and report it in class.

Self-pacing Method. It refers to the students' individual differences are recognized by giving the student the freedom to set his own schedule for learning and to monitor his own progress while the teacher acts as a consultant.

Socio-economic profile. This includes the profile of teachers as well as pupils. The teacher's profile include the age, gender, educational attainment, salary and years in service in teaching. While the pupils' profile include their age, gender and parents' occupation.

Teaching approach. This describes the viewpoint of the teacher described as teaching goal, the nature of the teaching-learning process, role of the teacher and plan and structure of the instruction.

Teaching method. This refers to a set of procedures which is done to achieve certain specific aims of instruction. This is procedural in nature.

Traditional Method. It refers to the teacher uses textbook learning, rote learning, directed technique and memorization.

Type of school It refers to the administration of either public or private entities.

Hypotheses of the Study

The following hypotheses were put forward for testing:

1. The Mathematics teachers are significantly different in their extent of use of the teaching approaches.

2. The Mathematics teachers significantly vary in the extent of providing activities to pupils in learning Math.

3. The Mathematics teachers significantly different in their degree of need to improve their teaching.

4. The grade VI pupils differ significantly in their competencies in Mathematics along

   a. Use of the four fundamental operations in whole numbers, fractions, decimals and word problems

   b. other areas in Elementary Mathematics

7. There is a significant relationship between the socio-economic profile of teachers and

   a. the extent of use of methods in teaching mathematics.

   b. Teaching approach

c. Extent of provision of activities in learning Mathematics

d. Needs for improving their teaching

METHODOLOGY

Locale of the Study

The study was conducted at two selected public schools in La Trinidad, Benguet and two selected public schools in Huai Hua of Hunan.

Chosen on the Philippines were Benguet State University Elementary Laboratory School and La Trinidad Central School; and in China were Xing Guang Elementary Laboratory School and Ying Feng Road Elementary School.

BSU is located at the heart of the municipality of La Trinidad. It is six kilometers away from Baguio City and a gateway to the mountain provinces. It first opened its door in 1916 as the La Trinidad Experimental Station. In 1946, it was called La Trinidad High School. Four years later, the special and normal curricula were added to its Agricultural Education Program. Later it became Mountain Nation Agricultural College (MNAC) then changed to Mountain State Agricultural College (MSAC) through Republic Act 59223.

Sixteen years later, on January 12, 1986, former President Ferdinand E. Marcos elevated the college to a state university by virtue of Presidential Decree 2010, thus it became Benguet State University.

BSU is considered as one of the biggest learning institutions in the Cordillera today. It has four levels of education, namely, elementary, secondary, tertiary, and graduate schools.

The Elementary Laboratory School, formerly named Ilang Elementary School,

was adopted into the institution in July 1979 as a part of the College of Teacher Education. It used to be under the direct supervision of the Department of Education.

The current population of the BSU Elementary Laboratory School is 563 pupils. It has 3 non-teaching staff and 15 teachers.

Huai Hua City is in the southwest of Hunan Province in China. Its area is 27,600 km and has a population of 4,800,000.

Xing Guang Elementary Laboratory School is located at the middle of Ying Feng Dong Road Huai Hua City. It was built in 1982; the whole school area is 1.2 hectares.

The school has 26 sections from grades 1-6 and has 995 students this school year. It has seven officers, 12 non-teaching staff, and 53 teachers. It is the first elementary laboratory school in Huai Hua City since the New Chinese Political and Economic System was reformed in 1980.

Ying Feng Road Elementary School is located at # 6 Yu Cai Alley of Ying Feng Zhong Road Huai Hua City. It was built in 1975. The whole area of the school is 153,000m².

The school has 66 sections from grades 1-6 and has 2,967 pupils this school year. It has 21 school officials and non-teaching staff, and 110 teachers. It is the key elementary school in Huai Hua City. It is directly administered by the Department of Education.

Respondents of the Study

This study used a total enumeration of the grade six pupils in Benguet State

University Elementary Laboratory School; the grade six pupils in La Trinidad Central School; the grade six pupils in Xing Guang Elementary Laboratory School; and the grade six pupils in Ying Feng Road Elementary School who are currently enrolled for the school year 2006-2007 as well as the Mathematics teachers.

There are 103 grade six pupils and eight Mathematics teachers in Benguet State University Elementary Laboratory School; 225 grade six pupils and 20 Mathematics teachers in La Trinidad Central School; 165 grade six pupils and 18 Mathematics teachers in Xing Guang Elementary Laboratory School; and 492 grade six pupils and 40 Mathematics teachers in Ying Feng Road Elementary School.

The four schools were chosen because they have almost of the same economic level and all are public elementary laboratory schools.

Table 1. Distribution of respondents

SCHOOL	PUPIL	TEACHER
Benguet State University Elementary Laboratory School	100	7
La Trinidad Central School	100	16
Xing Guang Elementary Laboratory School	100	8
Ying Feng Road Elementary School	100	10
Total	400	41

Research Design

This study is basically a descriptive-survey research. This approach was used since the researcher is interested in finding the extent of the level of Mathematics competencies among grade six pupils in Xing Guang Elementary Laboratory School and Ying Feng Road Elementary School in China and Benguet State University Elementary Laboratory School and La Trinidad Central School in the Philippines. The researcher gathered the data to find answers to the problems indicated in this study through questionnaires, interviews and actual observation. Questionnaires were used to find out the profile of grade six pupils. They were also used to determine the level of learning in Mathematics. Interview and observation were used to determine the time spent for learning Mathematics, the teaching approaches used by the teachers in teaching Mathematics, and to identify the activities provided to pupils in learning Mathematical contents taught in grade six.

Instrumentation

There were two sets of questionnaires which were answered by the grade six pupils and the Mathematics teachers of the four schools. The teacher's questionnaire includes background in the profession, methods and approaches in actual teaching, and personal opinion of what needs to be improved. The pupil's questionnaire includes background and a set of test in all areas of mathematics learned in grade VI.

Personal interviews to the pupils and teachers, and actual observation in their classrooms were done to supplement the questionnaires.

Data Gathering

The researcher constructed the questionnaires to know the profile of the pupils and identify their level of competency in the acquisition phase, mastery phase, generalization phase and maintenance phase.

The researcher also interviewed the grade six teachers of the given schools and observed in their classes to determine the time allotted for learning Mathematics and the methods used by the teachers, the activities they provided to their pupils, and the content of their lessons.

To validate the content of the self-constructed questionnaires on the level of competency of the pupils, the questionnaire was presented to a committee of authorities and experts in the field of Mathematics and education for evaluation.

Statistical Treatment of Data

Collected data were categorized, tabulated, and analyzed with the use of appropriate statistical tools. Descriptive statistics such as means, frequencies, percentages, and Pearson-product-moment correlation coefficient were used to describe the data.

Inferential statistics such as the One way and Two-way Analysis of Variance were used to test the hypotheses of significant differences between and among variables. . The t-test was used to test the significant relationship between variables tested in the study.

Comparisons were made at 0.05 level of significance.

RESULTS AND DISCUSSION

Profile of Respondents

The profile of respondents include a description of the socio-economic status of Mathematics teachers which include their age, gender, highest educational attainment, length of service in teaching and salary.

On the other hand, the profile of pupils include their age, gender and parents' occupation.

Socio-economic Profile of Mathematics Teachers

Age. Table 2 and Figure 4 show the percent distribution of Mathematics teachers according to their age. The Mathematics teachers from La Trinidad Central School range in age from 21 to over 61 years; from State University Elementary Laboratory School and Ying Feng Road Elementary School, 21 to 60 years; from Xing Guang Elementary Laboratory School, 21 to 50 years.

La Trinidad Central School has the greatest distribution of teachers who range in age from 21 to 30 years or 41 to 50 years. On the other hand, Xing Guang Elementary Laboratory School has highest percent distribution of teachers who range in age from 31 to 40 years at BSU, Huai Hua Ying Feng Road Elementary School and Xing Guang Elementary Laboratory School.

Overall, the great majority of Mathematics teachers are young , as indicated by the highest percent distribution at 21 to 40 years in the four schools. However, on the

Table 2. Percent distribution of respondents according to age

SCHOOL	N	AGE (YR)				
		21- 30	31 –40	41-50	51-60	Over 61
BSU Elementary Laboratory School	7	28.57	57.14	14.28	0.00	0.00
La Trinidad Central School	16	37.50	6.25	25.00	18.75	12.50
Ying Feng Road Elementary School	10	30.00	40.00	20.00	10.00	0.00
Xing Guang Elementary Laboratory School	8	12.50	62.50	25.00	0.00	0.00
AVERAGE	41	29.27	34.15	34.15	9.76	4.88

Legend: N- Total number of respondents

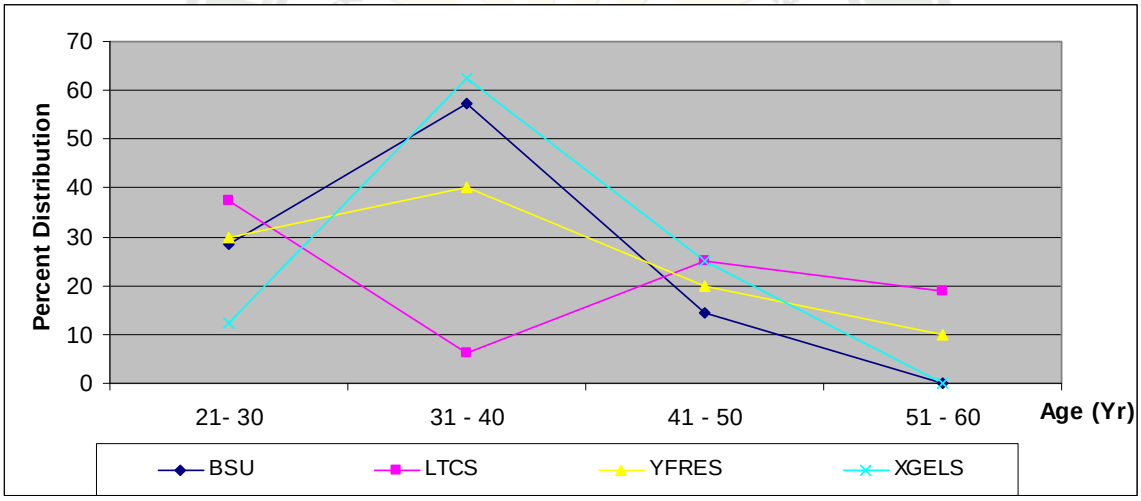


Figure 4. Percent distribution of Mathematics teachers according to their age

average, the teachers teaching Mathematics are in their middle ages as shown by the mean percent distribution of 34.15, at ages of 31 to 40 years or 41 to 50 years.

Gender. As gleaned in Table 3, the Mathematics teachers in all schools are dominated by females, whose average percent mean is 75.61.

Table 3. Percent distribution of teacher- respondents according to gender

SCHOOL	N	GENDER	
		Male	Female
BSU Elementary Laboratory School	7	28.57	71.42
La Trinidad Central School	16	6.25	93.75
Ying Feng Road Elementary School	10	40.00	60.00
Xing Guang Elementary Laboratory School	8	37.50	62.50
TOTAL	41	24.39	75.61

Legend: N- Total number of respondents

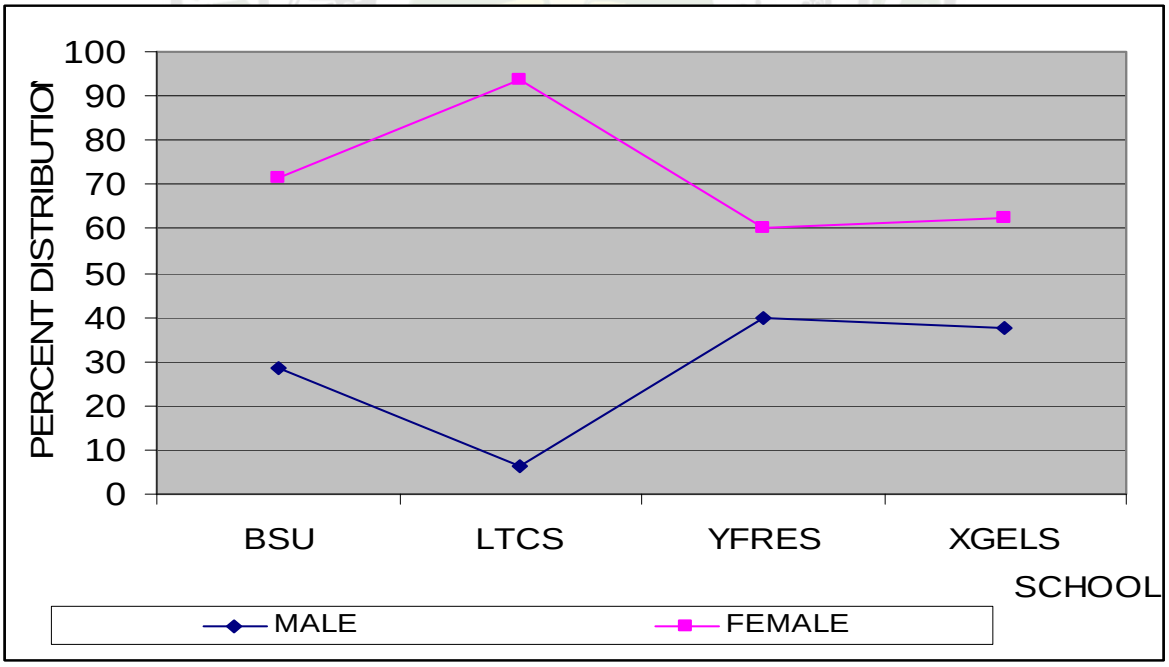


Figure 5. Percent distribution of Mathematics teachers according to gender

It is noteworthy to cite that Mathematics teaching is gender sensitive as manifested by the existence of many male teachers in three schools: Ying Feng Road Elementary School, 40 percent; and Xing Guang Elementary Laboratory School, 37.50 percent; and BSU Elementary Laboratory School, 28.57 percent. In the case of La Trinidad Central School, however, a few are male teachers, as indicated by a percentage of 6.25.

Educational Attainment. Table 4 shows that a great majority of the teachers are bachelor's degree holders. However, only in BSU Elementary Laboratory School have the a greater majority of the Mathematics teachers with master's degree.

It appears that La Trinidad Central School does not implement the Civil Service Rule providing a minimum requirement of Master's degree for its employed teachers. This finding jibes with the observation of Toledo (1982) that a great number of Mathematics teachers have not advanced professionally.

Conversely, in the two schools in China, few Mathematics teachers are master's degree holders. This finding indicates having master's degree is a minimum requirement for employment in teaching.

As a whole, only La Trinidad Central School does not strictly implement the minimum requirement for obtaining a master's degree. Thus, it may be inferred that professional development is not much emphasized in the school.

The foregoing findings would indicate significant contributions in the improvement of the quality of the teachers that the system employs and this is confirmed

Table 4. Percent distribution of teacher respondents according to highest educational Attainment

SCHOOL	N	EDUCATIONAL ATTAINMENT	
		Bachelor's Degree	Master's Degree
BSU Elementary Laboratory School	7	42.86	57.14
La Trinidad Central School	16	100.00	0.00
Ying Feng Road Elementary School	10	80.00	20.00
Xing Guang Elementary Laboratory School	8	87.50	12.50
TOTAL	41	82.93	17.07

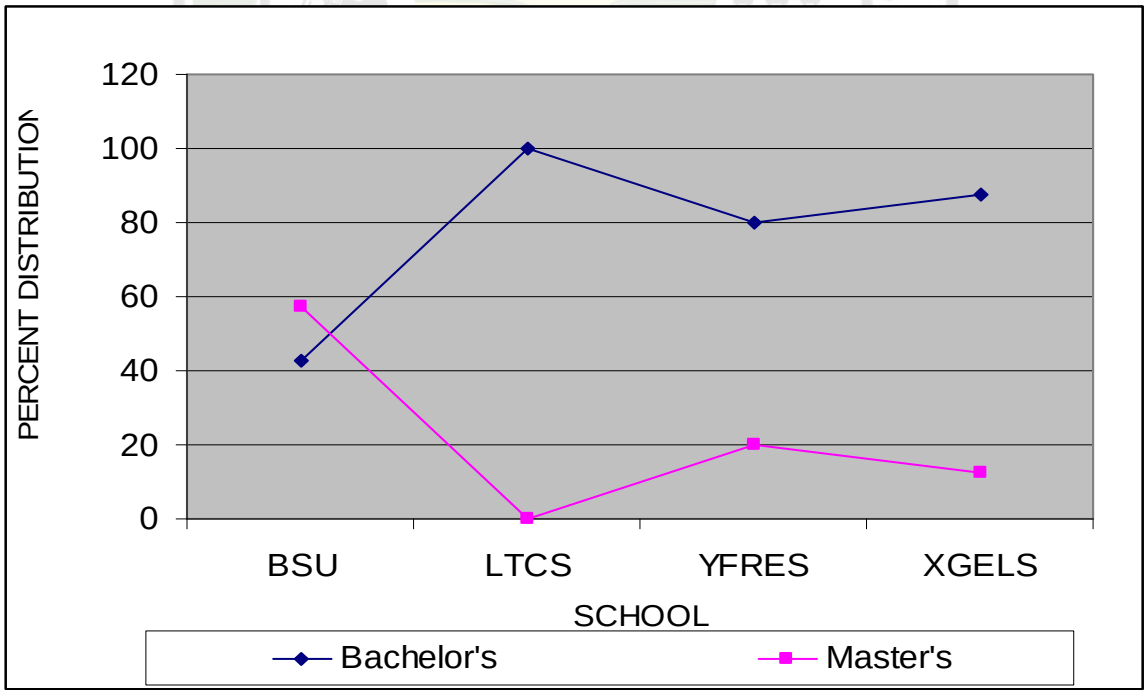


Figure 6. Percent distribution of Mathematics teachers according to highest educational attainment

by Guerrero (1989). Tating (1993) cited that the teacher occupies a most important place in modern society and that his knowledge of his field accompanied with experience, prepares the pupils in meeting , Thus, one of the best measures of teachers, as found by Lubrica (1996), is their academic and professional training.

Length of service. As gleaned in Table 5, the great majority of teachers have taught Mathematics for 6 to 10 years. This is followed by those who have taught the subject for less than six years and those who have taught it for over 20 years. Specifically, the greatest percentage of teachers in La Trinidad Central School have taught for 5 – 10 years; BSU-ELS, 6- 10 years; Xing Guang Elementary School, 11-15

Table 5. Percent distribution of teacher respondents according to length of service in Teaching

SCHOOL	N	LENGTH OF SERVICE (YR)				
		0 – 5	6 – 10	11– 15	16-20	Over 20 years
BSU Elementary Laboratory School	7	14.28	71.43	0.00	14.28	0.00
La Trinidad Central School	16	37.50	18.75	0.00	18.75	25.00
Ying Feng Road Elementary School	10	10.00	20.00	30.00	30.00	10.00
Xing Guang Elementary Laboratory School	8	0.00	12.50	50.00	25.00	12.50
TOTAL	41	29.27	36.58	13.79	14.63	9.76

Legend: N- Total number of respondents

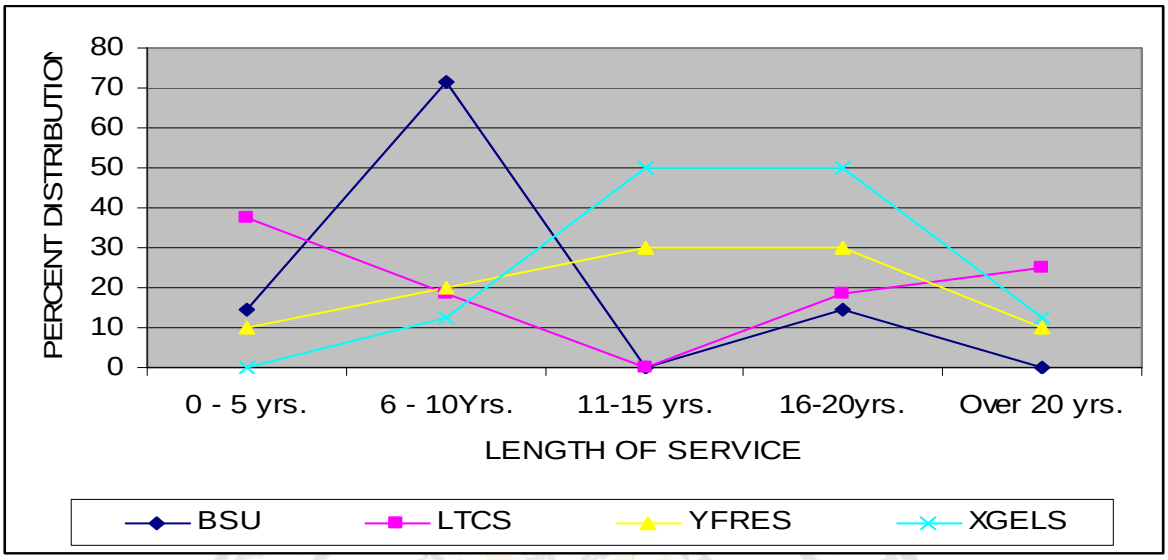


Figure 7. Percent distribution of Mathematics teachers according to length of service

years; and Ying Feng Road Elementary School, 16-20 years. At the same time, La Trinidad Central School has the highest percentage of teachers who have taught the subject for over 20 years.

Comparatively, Figure 6 shows that BSU Elementary School has the highest number of teachers having the longest length of service, 6- 10 years. This finding is supported by the age distribution (Table 2), which is likewise high.

Salary received. The salary received by teachers teaching Mathematics range from PhP 8,000 to above PhP 18,000 (Table 6). But the four schools have varied percent distribution. The teachers of BSU ELS range in salary from PhP 8,000 to PhP 16,000; La Trinidad Central School, from PhP 8,000 to PhP 14,000; Yeng Feng Road Elementary School, from PhP 8,000 to above PhP 18,000; and Xing Guang Elementary Laboratory

Table 6. Percent distribution of teacher- respondents according to salary

SCHOOL	N	SALARY (PhP)					
		8,000-10,000	10,001-12,000	12,001-14,000	14,001-16,000	16,001-18,000	Above 18,000
BSU Elementary Laboratory School	7	14.28	57.14	14.28	14.28	0.00	0.00
La Trinidad Central School	16	56.25	31.25	12.50	0.00	0.00	0.00
Ying Feng Road Elementary School	10	10.00	30.00	20.00	20.00	10.00	10.00
Xing Guang Elementary Laboratory School	8	12.50	37.50	25.00	12.50	12.50	0.00
TOTAL	41	29.27	36.58	17.07	9.76	4.88	2.44

Legend: N- Total number of respondents

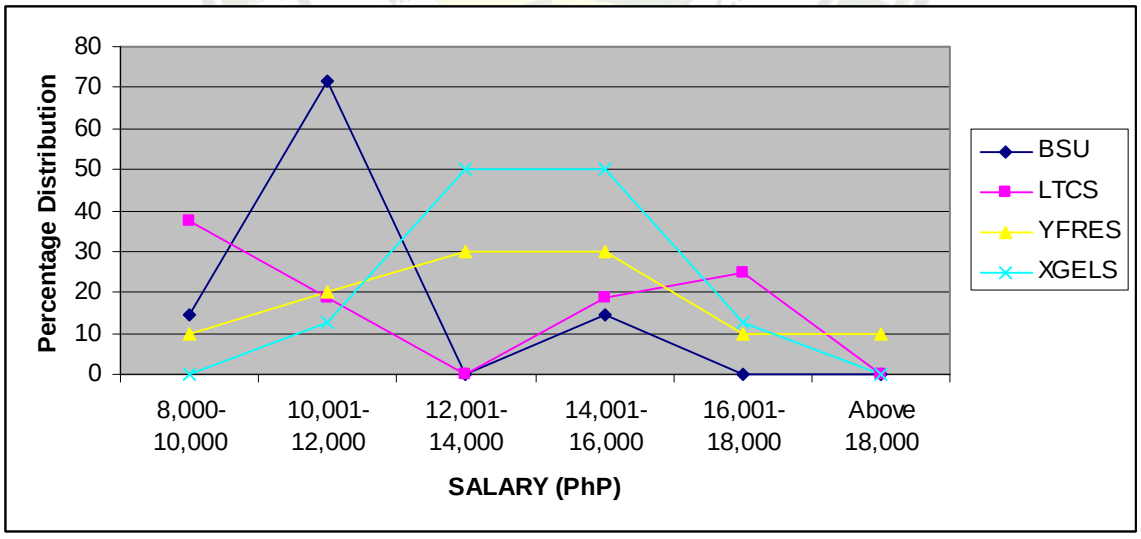


Figure 8. Percent distribution of teacher-respondents according to salary

School, from PhP 8,000 to PhP 18,000. Comparatively, teachers from La Trinidad Central School have the lowest salary range. Although 100 percent of its faculty have the highest degree earned. Despite the differences in salary scale between China and Philippines, the results would indicate the relevance of educational attainment, which is compensated with salary increase.

The foregoing findings on socio-economic profile are related to the study conducted by Lubrica (1996) indicating that for teachers to improve in their teaching, they should have more academic and professional trainings in their field of specialization, shall have more teaching experiences, and should participate more in seminars and workshops relative to Mathematics.

Socio-economic Profile of Grade VI Pupils

The socio-economic profile of pupils include their age, gender and parents' occupation. These data were used to describe the performance of the pupils as affected by these variables.

Age distribution. As gleaned in Table 7 and Figure 9, the majority of grade six pupils range in age from 11 to 12 years. This finding indicates that these pupils have been admitted in grade one at aged six or seven. This finding is in line with the Department of Education Memorandum that mandates admission age be seven years. Nevertheless, the memorandum allows those aged six to enter grade one. With those admitted at an earlier age of five years, it is assumed that these children have entered pre-

Table 7. Frequency distribution of respondents according to age

SCHOOL	AGE (YR)				
	10	11	12	13	TOTAL
BSU Elementary Laboratory School	4	57	39	0	100
La Trinidad Central School	1	61	33	5	100
Ying Feng Road Elementary School	0	32	65	3	100
Xing Guang Elementary Laboratory School	0	44	49	7	100
TOTAL	5	194	147	15	361

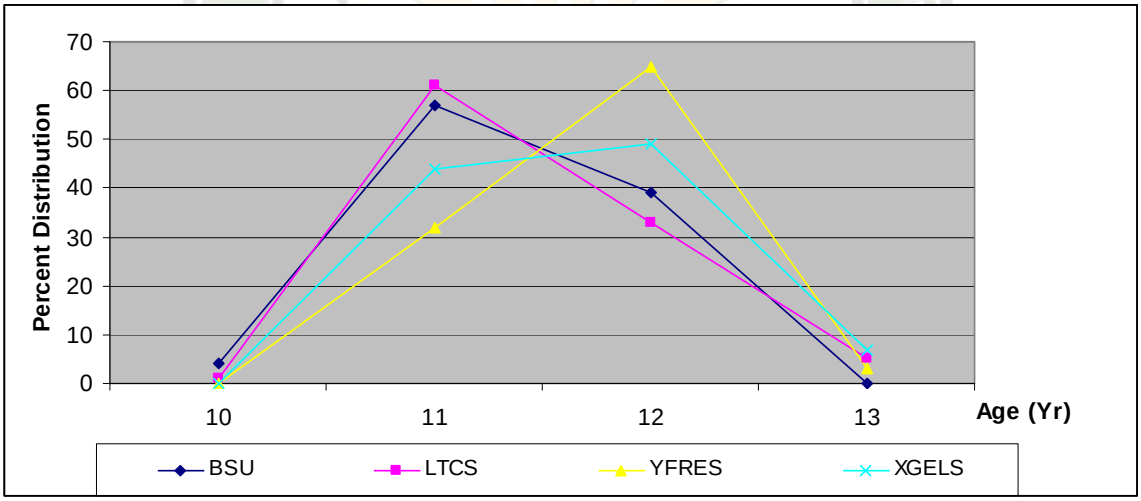


Figure 9. Frequency distribution of student- respondents according to their age

school at 5 ½ years and have proven their acceptance in grade one having passed the exams.

Likewise in China, the distribution shows an admission age of six and seven as reflected by the frequency distribution.

BSU Elementary school adheres to the Department of Education Memorandum indicating an admission age of six. The three other schools admit pupils in grade one at ages six to eight.

Gender. As gleaned in Table 8 and Figure 10, females dominate the males as manifested in the consistent distribution among all the three schools. Conversely, in

Table 8. Frequency distribution of pupil- respondents according to gender

SCHOOL	GENDER	
	Male	Female
BSU Elementary Laboratory School	43	57
La Trinidad Central School	46	54
Ying Feng Road Elementary School	53	47
Xing Guang Elementary Laboratory School	57	43

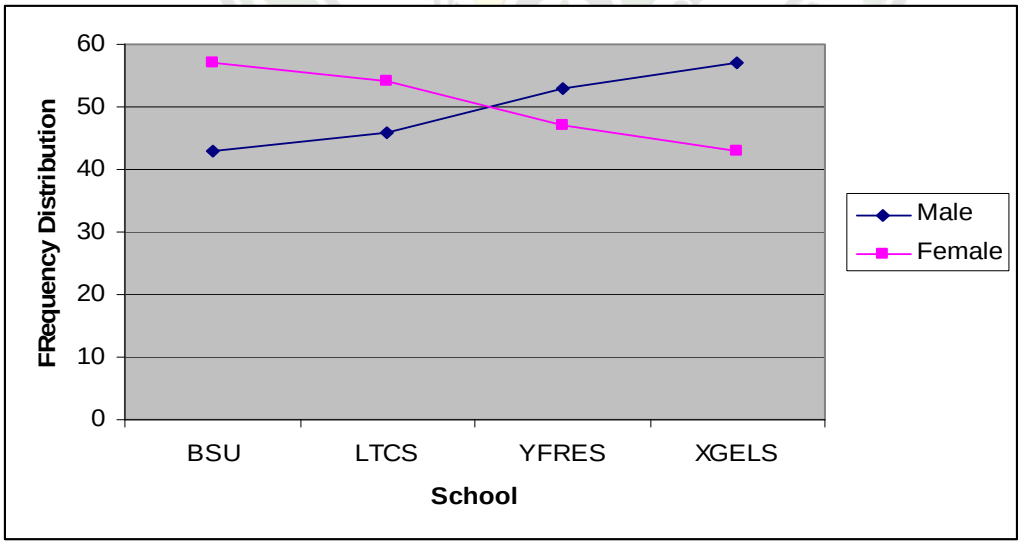


Figure 10. Frequency distribution of pupil- respondents according to gender

Xing Guang Elementary Laboratory School, more males are found among the grade six pupils with frequency distribution at 57 for males and 43 for females. However, the distribution between males and females is not widespread as manifested by a small difference.

Parents' occupation. Table 9 reveals the distribution of pupil-respondents according to occupation of both mother and father. The distribution shows that both mother and father are working.

A greater percentage of the pupils' mothers and fathers are involved in blue collar jobs than in white collar jobs. A greater number of unemployed mothers are observed in BSU Elementary Laboratory School and La Trinidad Central School.

Table 9. Frequency distribution of respondents according to parents' occupation

SCHOOL		EMPLOYMENT			
		Unemployed	Blue Collar	White Collar	TOTAL
BSU Elementary Laboratory School	Father	0	61	28	89
	Mother	29	35	29	93
La Trinidad Central School	Father	3	75	14	92
	Mother	32	43	12	87
Ying Feng Road Elementary School	Father	1	43	56	100
	Mother	3	45	52	100
Xing Guang Elementary Laboratory School	Father	0	39	61	100
	Mother	7	42	51	100
TOTAL		75	384	251	

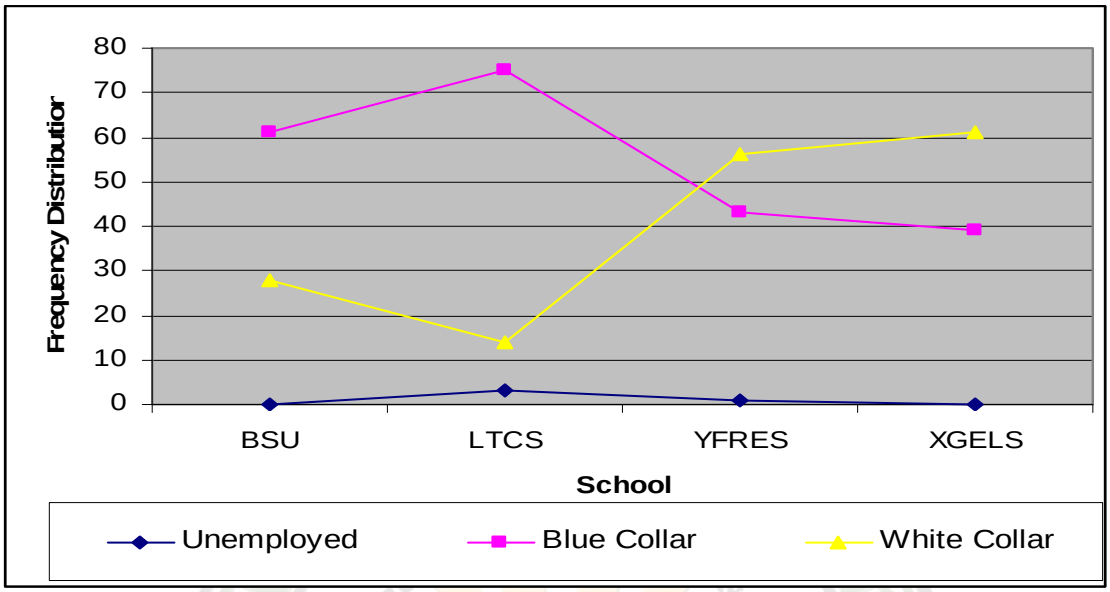


Figure 11. Frequency distribution of student-respondents according to the nature of employment of their father.

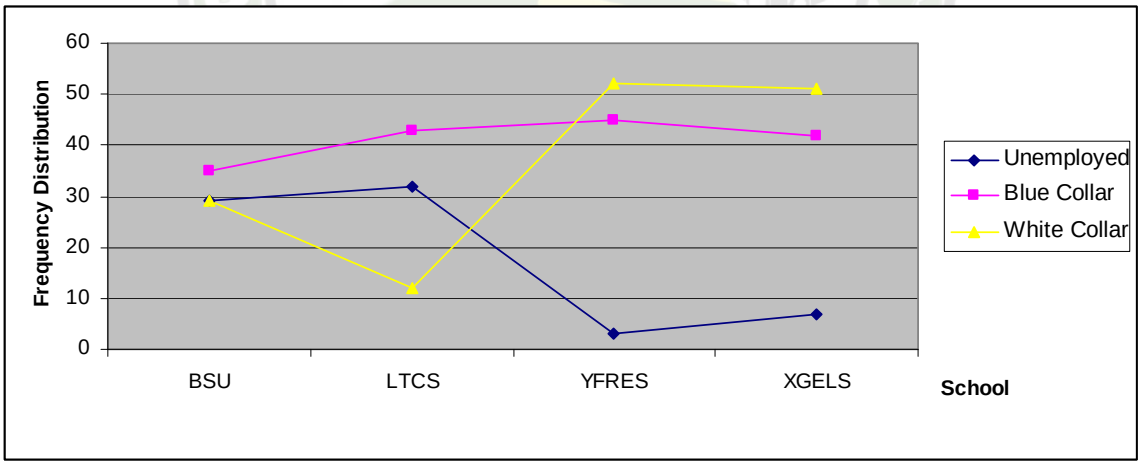


Figure 12. Frequency distribution of student-respondents according to the nature of employment of their mother.

The foregoing results show that the pupils are economically sufficient in terms of their support for schooling.

Teaching Approach Used By Teachers in Teaching Mathematics

Table 10 reveals the discovery, conceptual, process and unified approaches are frequently used by teachers in teaching Mathematics. In BSU Elementary Laboratory School, all the teaching approaches are frequently used, with the process approach having the highest mean. This finding would indicate that the teachers focus more on the development of the pupils' skills and the determination of pupils' weaknesses in their skill formation. The pupils are also taught to learn to search for solutions of a problem through exploration and evaluation and their previous learning is reinforced by their Mathematics teachers.

Conversely, the other three schools most frequently use the unified approach. This finding indicates that the teachers from La Trinidad Central School, Ying Feng Road Elementary School and Xing Guang Elementary Laboratory School focus their teaching on the presentation of content geared towards student vocabulary, which is expanded through citation of relevant examples and concrete situations.

The use of the four approaches in teaching Mathematics is significantly different among the teachers, as indicated by the computed value of 4.00 which is higher than tabular value of 1.92. It may be inferred that varied use of teaching approaches in teaching their students in Mathematics. The difference can be attributed to the fact that the students have varied characteristics, motivation and abilities. These could be factors affecting the instructional decision of teachers in designing their instructional program of their pupils.

Table 10. Teaching approach used by Mathematics Teachers

APPROACH	SCHOOL				
	BSUELS	LCS	YFRES	XGELS	OWM
• Discovery	3.46	3.40	3.38	3.39	3.41
• Conceptual	3.78	3.48	3.70	3.63	3.65
• Process	3.78	3.46	3.82	3.71	3.69
• Unified	3.71	3.59	3.85	3.80	3.74
OVERALL WEIGHTED MEAN	3.68	3.48	3.69	3.63	3.62

$F_{(\text{between teaching approach})} = 4.00^{s}$ $F(0.05) = 1.92$

$F_{(\text{between schools})} = 5.67^{S}$ $F(0.05) = 2.84$

Legend: s- significant

Statistical Limit	Descriptive Value	Interpretation
3.26 – 4.00	Frequently utilized	76% - 90% used in most instruction
2.51 – 3.25	Often utilized	50% - 75 % used in instruction
1.76 – 2.50	Seldom utilized	less than 50% used in instruction
1.00 – 1.75	Not used	

The four schools significantly differ in their use of the teaching approaches, as revealed by the computed F-value of 4.00 being significantly higher than the tabular F-value at 1.92. Furthermore, the overall weighted mean indicates that the teachers of Yang Feng Road Elementary School have a significantly highest use of all the teaching approaches as compared to the other three schools.

Instructional variety characterizes an effective teacher. As claimed by Levak et al. (1993), flexibility allows teachers to utilize alternative approaches across disciplines, instead of forcing connections where connections do not exist. Their use of alternative approaches seems to engender success.

It is therefore inferred that teachers teaching Mathematics vary in their instructional approaches, which may come in the form of variation in activities, learning experiences and learning materials. However, this variation should be clearly employed to make learning more meaningful.

As a whole, the hypothesis of significant difference in the frequency of use of the teaching approaches by teachers is therefore accepted.

Teaching Methods Employed by Teachers in Teaching Mathematics

As gleaned in Table 11, varied methods are used by teachers in teaching Mathematics teacher from BSU Elementary Laboratory School frequently use lecture, discussion, activity, inductive, deductive, recitation, integrated, problem-solving and assignment; oftenly use investigatory, traditional, modular and practice and drill method; seldom use reporting and self-pacing method. Although using varied activities in teaching Mathematics, the teachers frequently use activity method, inductive method and problem-solving method.

Conversely, the teachers of La Trinidad Central School frequently use lecture, reporting, demonstration, activity, inductive, deductive, self-pacing, traditional,

Table 11. Teaching Methods used by teachers

METHOD	SCHOOL			
	BSU	LTCS	YFRES	XGELS
The students are provided with needed information by factual presentation and textual explanation of a particular topic (Lecture Method)	3.43	3.50	3.56	3.12
Students are guided to give a free exchange of ideas about a particular topic (Discussion Method)	3.43	3.25	3.78	3.62
Students are allowed to search for information about a given topic and report it in class (Reporting Method)	2.28	3.94	2.67	2.88
Teacher shows a step by step presentation through concrete actions and materials of which the students will observe (Demonstration Method)	2.73	3.67	3.56	3.38
The students are engaged in the activity to have a first hand experience about the concept being learned (Activity Method)	3.71	3.50	3.11	3.50
The students are taught starting from the known to the unknown; from the specific to the general; from the particular to the universal; from simple to complex; and from the concrete to the abstract (Inductive Method)	3.71	3.69	3.67	3.75
The teacher begins teaching from a generalization and subsequently gives examples and specific situations that are supportive of it (Deductive Method)	3.43	3.31	4.00	3.50
Students are required to do an experiment, conduct an investigation, try out different alternatives to solve a given problem (Investigatory Method)	3.14	3.19	3.22	3.38
Students' individual differences are recognized by giving the student the freedom to set his own schedule for earning and to monitor his own progress while the teacher acts as a consultant (Self-pacing Method)	2.43	3.38	3.70	3.25
The teacher uses textbook learning, rote learning, directed technique' and memorization (Traditional Method)	2.57	3.44	4.00	3.88
The students are made to focus on sets of questions which are answered from reading books and other printed materials. They share their insights and answers during the class session. (Recitation Method)	3.43	3.44	3.56	3.25
Teacher combines two or more subjects to explain a main topic. One is a springboard and the other is the main topic. Other subject areas could be supportive to the main topic. (Integrated Method)	3.57	3.19	3.78	3.50
Teacher sets a good criteria for students to come up with a solution (Problem-solving Method)	3.71	3.25	4.00	4.00
Students are given a self-contained and independent unit of instruction with specific objectives. The student is given an opportunity to know the specific objectives and do the learning activities by following specific procedures. (Modular Method)	2.71	2.94	3.78	3.50
Students are given interesting homework that requires a little research or participation and assistance from family members (Assignment Method)	3.28	3.69	4.00	3.88
Students are required to practice and master important prerequisite skills necessary for the whole lesson. Constant review is necessary. (Practice and Drill Method)	3.14	3.69	4.00	4.00
OVERALL WEIGHTED MEAN	3.17	3.38	3.65	3.52

$F_{(\text{between teaching methods})} = 1.73^{ns}$ F(0.05) = 1.92

$F_{(\text{between schools})} = 6.361.73^{S}$ F(0.05) = 2.84

Legend: ns- sot significant, s- significant

Statistical Limit	Descriptive Value	Interpretation
3.26 – 4.00	Frequently utilized	76% - 90% Used in most instruction
2.51 – 3.25	Often utilized	50% - 75 % used in instruction
1.76 – 2.50	Seldom Utilized	less than 50% used in instruction
1.00 – 1.75	Not used	

recitation, assignment and practice drill method; and oftenly use discussion, investigatory, integrated, problem-solving, and modular. The results show that reporting method is most frequently used and modular is least. This finding could be attributed to the fact that pupils are made to work in pairs or groups and then made to report results after the task is done, and that the teachers satisfy the required competencies prescribed by the Philippine Elementary Competency standards.

On the other hand, teachers of the Ying Feng Road Elementary School have a relatively higher frequency of use of all the identified methods. Seventy-six to 90 percent of their instruction involves the use of lecture, discussion, demonstration, inductive method, deductive method, self-pacing, traditional, recitation, integrated, problem-solving, modular, assignment and practice and drill method. Some 50 to 75 percent of the teachers' instruction involves oftenly the use of reporting, activity and investigatory. Such results would indicated a wide use of the methods for Mathematics instruction.

Lastly, most teachers of Xing Guang Elementary Laboratory School frequently use more teaching methods; few seldom use them. Those claimed to be frequently used are discussion, reporting, demonstration, activity, inductive, deductive, investigatory, traditional, integrated, problem-solving , modular, assignment and practice and drill.

Such results would show that teachers in Xing Guang give emphasis on those methods that are frequently used in teaching Mathematics.

Despite the differences in means of frequency of use, the methods used are not significantly different among teachers teaching Mathematics, As indicated by the computed F-value of 1.73 and a tabular F-value of 1.92. This result implies that the methods employed are applicable to teaching content and competencies in Mathematics.

Comparatively, the four schools significantly differ in their frequency of use of the teaching methods. In BSU, consistently highest in frequency for activity are inductive method and problem-solving. Reporting method is highest for La Trinidad central; traditional method, problem solving, assignment and practice drill method for Ying Feng Road Elementary School; and problem solving and practice and drill method for Xing Guang Elementary Laboratory School. This difference implies that the schools vary in the frequency of use of all the methods and that the type of school system differs in terms of what the teachers and students could bring to the classroom. These requirements include the nature of teachers, content and competencies to be taught in Mathematics, location of the school and characteristics, motivation and abilities of pupils entering the school system.

The above findings show how important the teacher's competence in making the pupils learn Mathematics through appropriate use of methods. Thus, as suggested by Salandanan (1988), and methods must be appropriate for given behavioral objectives and concepts. Meanwhile, Lardizabal et al (1991) stated that before taking up specific techniques for organizing classroom activities, it is best to consider first the social needs

of pupils in planning classroom experiences which can be expressed in terms of abilities required to satisfy them. Practices have gradually replaced undesirable features of so-called hearing procedures which is due in part to the gradual acceptance of the newer philosophy of education.

Further, the use of methods characterizes effective teachers as possessing five key behaviors which are related to lesson clarity, instructional variety, task orientation and engagement in the learning process, and student success. Elliot et al. (2000) stated that a teacher's teaching techniques remain flexible during the presentation of the lesson. A secondary Chinese school teacher, Guofu (2006), presented new Mathematics teaching process relating to how a teacher structures his questions, carries out his instructional plan and re-plans for instructional improvement. The teaching process should intend to develop students' ability as well as their personality. Valuing process in learning forms part of the instructional component of curriculum development in Mathematics.

Extent of Provision of Activities in Teaching Mathematics

Table 12 presents the activities provided to students in teaching Mathematics. As shown, the teachers provide varied activities during the teaching learning process in Mathematics. However, Yang Feng Road Elementary School provides most. Frequently provision of activities in teaching Mathematics. Following in descending order of frequency are Xing Guang Elementary Laboratory School, BSU Elementary Laboratory School and La Trinidad Central School.

Table 12. Extent of provision of activities in teaching Mathematics

ACTIVITIES	SCHOOL			
	BSU	LCS	YFRES	XGELS
Recitation	4.86	4.62	4.00	3.75
Problem-solving	4.28	4.12	5.00	4.62
Board Work	4.57	4.25	5.00	5.00
Assignment/homework	4.28	3.94	5.00	4.88
Quizzes	4.71	4.15	5.00	4.88
Tests/Examinations	4.28	3.87	5.00	4.75
Discussion with classmates	3.57	3.62	4.40	4.12
Solving through modules	4.00	3.69	4.40	4.12
Memorization/Rote learning	2.71	3.06	4.50	4.00
Drawing and paper cutting	3.57	3.39	4.30	3.25
Other activities	2.71	2.94	2.70	2.12
OVERALL WEIGHTED MEAN	3.96	3.78	4.48	4.13

$F_{(\text{between activities})} = 10.60^{s}$ F(0.05) = 2.16
$F_{(\text{between schools})} = 6.47^{S}$ F(0.05) = 2.92

Legend:

Statistical Limit	Assigned Value	Description
4.21 – 5.00	5	Very frequently utilized
3.41 – 4.20	4	Frequently utilized
2.61 – 3.40	3	Moderately utilized
1.81 – 2.60	2	Seldom utilized
1.00 – 1.80	1	Not utilized

The four schools significantly differ in the extent of providing activities in the teaching of Mathematics, as indicated by a computed F-value of 6.88 which is significantly higher than the tabular F-value of 2.96. The difference may be attributed to the prescribed mathematical competencies intended to be learned by grade six pupils. In the Philippines, BSU and La Trinidad Central School teachers are guided by the Philippine Elementary Learning Competencies (PELC), which prescribes the minimum content and competencies for learning Mathematics. The variation could likewise be attributed to the differences in the educational systems between the Philippines and China and the goals of the institutions.

On the other hand, the activities do not significantly vary among all the teachers in terms of the extent of providing activities to pupils learning Mathematics. The extent of provision of activities IS presented in decreasing mean values, as follows: board work, quizzes, assignment/homework and problem-solving. Board-work, assignment/homework and quizzes are activities provided in the mastery level of learning. Evaluation of performance test and providing quizzes are the most convenient methods. The provision of other activities, evidently is lowest in extent. Such as enrichment and enhancement of learning.

The hypothesis of significant difference in the provision of activities among Mathematics Teachers and among the four schools is therefore accepted,

Table 13. Degree of need in identified areas to improve teaching Mathematics among grade VI pupils.

AREA	BSU	LCS	YFRES	XGELS	OWM
Attendance to in-service trainings	3.28	3.12	2.60	3.25	3.06
Attendance to seminars	3.43	3.19	2.60	3.12	3.08
Making Modules	3.43	2.81	2.20	2.62	3.08
Upgrading of subject content	3.14	3.00	1.70	2.62	2.62
Conduct of action research	3.43	2.62	2.00	2.50	2.64
Update on current strategies	3.57	3.19	2.70	3.25	3.18
Improvise teaching aids	3.57	3.19	2.90	3.50	3.29
Use of modern technology	3.43	3.00	3.10	3.50	3.26
Increase in teaching time	2.71	2.88	1.30	1.25	2.04
Use of other textbooks	3.86	3.25	1.50	1.62	2.56
OVERALL WEIGHTED MEAN	3.39	3.02	2.26	2.72	2.85

$F_{(\text{between needs})} = 9.21^{s}$ F(0.05) = 2.66

$F_{(\text{between schools})} = 8.86^{S}$ F(0.05) = 3.16

Legend: ns- sot significant, s- significant

Statistical Limit	Descriptive Value
3.26 – 4.00	Very much needed
2.51 – 3.25	Much needed
1.76 – 2.50	Needed
1.00 – 1.75	Not needed

Perceived Degree of Needs in Specific Areas
in Teaching Mathematics

Table 13 presents the Mathematics teachers' needs in improving the teaching of Mathematics.

In the case of BSU Elementary Laboratory School, the teachers feel that to improve their teaching in Mathematics they must attend in-service trainings and seminars, make modules, conduct action research, update current strategies, improvise teaching aids, use modern technology and use other textbooks. They also need much to upgrade subject matter to increase teaching time. This finding implies that although knowledgeable of the content, the teachers have inadequate skills in instructional delivery and inadequate instructional materials.

The teachers in La Trinidad Central School have fewer needs to improve their teaching in Mathematics than those in BSU, as indicated by the mean values reflecting a great need of specified areas.

The same areas ae perceived as needs for improving teachers in their teaching of Mathematics in Ying Feng Road Elementary School (YFRES). Those areas which are much needed in improving the teachers are attending in-service training and seminars, updating of current strategies and improvising teaching aids. A lesser degree of need to improve the teacher is felt on making modules and conducting action research. The teachers in the same school claim they have the content, enough textbooks and enough time in teaching Mathematics implying that these are not priority areas for their improvement. Overall, the teachers feel the need to improve their teaching of

Mathematics.

Conversely, teachers of Xing Guang Elementary Laboratory School feel that they need very much to improve in improvising their teaching aids and updating current strategies in teaching, much need to improve themselves in their teaching by attending training and seminars, making modules, upgrading subject matter, updating current strategies, improvising teaching aids and using modern technology in teaching. They also feel to a lesser degree the need to improve their means of conducting research. The teachers claim that they do not need to increase their time in teaching and to use textbook. This result implies that the teachers are adequate in their textbooks but need to improve on other areas where priority is based on the degree of need.

The teachers significantly differ in areas where they need to improve their instruction in Mathematics. Likewise, the schools vary significantly in the degree of needs to improve their teachers along the specified areas. This finding implies that all the teachers are not one in their perception and although they seek to improve in their teaching of Mathematics. This is an indication that the teachers desire to become effective and efficient in the identified areas. The difference in perceptions stem from the governance of the school systems which differ from one another.

It is therefore inferred that the degree of needs for improving teaching along specified areas is accepted for the schools and rejected according to needs.

Performance of Grade VI Pupils in Mathematics

Table 14 reveals the performance of grade VI pupils coming from the four schools. The data were generated from a test administered to the pupils. These are used to support the foregoing discussions in identifying areas where the pupils are competent.

Pupils in Ying Feng Road Elementary School perform highest as evidenced by the mean score of 28.83. This is followed in decreasing mean scores of 28.14, Xing Guang Elementary School; 23.39 for La Trinidad Central School; and 21.13 for BSU Elementary Laboratory School. Such results show that the pupils are proficient in Mathematics since each mean score has surpassed the cut off score at 17.5.

However, only the pupils of La Trinidad Central School have a positive skewed distribution which indicates that they are generally low performers in Mathematics despite some pupils getting scores below the mean score. Such distribution show that there are more low performing pupils than high performing ones.

Table 14. Performance of grade VI pupils in Mathematics

SCHOOL	QUANTITAIVE MEASURE OF PERFORMANCE			TYPE OF DISTRIBUTION
	Mean	Median	Mode	
BSU Elementary Laboratory School	21.13	20.78	21.5	Negatively skewed
La Trinidad, Central School	23.39	24.5	22	Positvely skewed
Ying Feng Road Elementary School	28.83	28.5	27	Negatively skewed
Xing Guang Elementary Laboratory School	28.14	26.5	30	Positively skewed

On the other hand, the pupils from BSU, Ying Feng Road Elementary School and Xing Guang Elementary Laboratory School are negatively skewed in their distribution. The negative skewed distribution implies that a greater number of pupils perform higher than the mean score of their respective group and that the three groups are composed of high-performing pupils.

The differences in the mean performance of pupils may be attributed to the provision of mathematical experiences of teachers suitable to the state of development of their concept and the method of presentation by teachers to improve the pupils' level of thinking (Salandanan et al., 1988). Borich (1992) cited one attribute in Mathematics learning and this is related to lesson clarity, which refers to how clear the teacher makes his presentation to the class.

Bawang (1995) presented some problems encountered in teaching Mathematics. The problems can be attributed to computational weakness among the pupils. Many students, despite a good understanding of mathematical concepts, are poor of computing.

However, a Chinese Mathematics researcher, Wen Jie (2005), found that interest is the most active factor in learning Mathematics and to improve it depends on the teacher's role. This suggestion was supported by Wu Guiti (2006) who repeated that the teacher's knowledge, concept and method, must be practiced by the students in actual activities.

Competencies of Grade Six Pupils in
Varied Areas in Mathematics

Table 15 and 16 reveal the performance of students in different areas in Mathematics. These areas include using mathematical operations in whole numbers, fractions, decimal numbers, and word problems; ratios, ratio and proportion, transforming number to percent; identifying solid objects, measurements of angles of solid objects and computing an area of solid objects.

Mathematical Operations

In mathematical operations in whole numbers (Table 13), the grade six pupils are most competent in addition. A total of 191 out of 400 pupils coming from the four schools excel in it. This is followed by subtraction, multiplication and division. The pupils from BSU- Elementary Laboratory School, La Trinidad Central School and Ying Feng Road Elementary School are consistently highest in their competency in addition followed in decreasing distribution by subtraction, multiplication and division. On the other hand, pupils of Xing Guang Elementary Laboratory School are competent in subtraction followed by addition division and multiplication. The findings imply that the grade VI pupils from different school significantly vary in competencies in using the four fundamental operations in whole numbers.

Generally, all the pupils in the four schools do not significantly differ in their competence in addition of whole numbers, subtraction, multiplication, and division. Such results imply that although the pupils excel in mathematical operation of whole

Table 15. Competencies of grade six pupils using the four fundamental operations in Mathematics

COMPETENCY	SCHHOL			
	BSU	LTCS	XING GUANG	YING FENG
1. Whole numbers				
Addition	50	48	47	46
Subtraction	44	47	47	47
Multiplication	28	37	42	42
Division	21	14	41	43
$F_{(\text{between mathematical operation})} = 5.09^{s}$			F(0.05) = 3.86	
$F_{(\text{between schools})} = 1.46^{ns}$			F(0.05) = 3.86	
2. Fractions				
Addition	36	34	43	44
Subtraction	36	18	44	42
Multiplication	35	35	72	78
Division	21	12	24	39
$F_{(\text{between mathematical operation})} = 7.86^{s}$			F(0.05) = 3.86	
$F_{(\text{between schools})} = 6.89^{S}$			F(0.05) = 3.86	
3. Decimal numbers				
Addition	47	47	47	47
Subtraction	48	49	44	41
Multiplication	31	35	22	40
Division	21	15	36	41
$F_{(\text{between mathematical operation})} = 5.58^{s}$			F(0.05) = 3.86	
$F_{(\text{between schools})} = 0.46^{ns}$			F(0.05) = 3.86	
4. Word Problems				
Addition	19	41	45	44
Subtraction	37	44	49	43
Multiplication	19	35	38	38
Division	37	45	46	45
$F_{(\text{between mathematical operation})} = 6.28^{s}$			F(0.05) = 3.86	
$F_{(\text{between schools})} = 13.21^{S}$			F(0.05) = 3.86	

numbers, they still need to improve further the competencies in mathematical operations in Mathematics, as indicated by the mean distribution which is below 200. It may be inferred that there is a need to improve the competencies of pupils using the four fundamental operations in Mathematics. Some four schools are one in the distribution along the four fundamental operations, the pupils do not significantly differ in their competence along this area.

On the use of the four fundamental operations in Mathematics in fractions, pupils are proficient in multiplication of fractions as compared to addition, subtraction and division, as indicated by the mean frequency distribution below 200. This is observed to be consistently highest in La Trinidad Central School, Xing Guang and Ying Feng indicating their pupils to be proficient in multiplication followed by addition, subtraction and division of fractions. Conversely, BSU pupils are competent but low in addition and subtraction followed by multiplication and least for division. Only the pupils in Chinese schools showed their proficiency in multiplication of fractions but they are consistently low in all the other mathematical operation.

The competencies of grade six pupils in the use of the four fundamental operations in fractions significantly vary, as indicated by the observed values, where the computed f-values are significantly higher than the tabular F-values. Such results imply that the pupils in BSU and La Trinidad Central School need to improve their competency in using the four fundamental operations in Mathematics in fractions. In the two Chinese

\

schools, there is a need to improve the competencies of pupils in addition, subtraction and division of fractions.

The pupils of the four schools do not significantly vary in their competencies in the use of the four fundamental operations in decimal numbers. Although the distribution is lower than the mean frequency distribution, BSU and La Trinidad Central School have the highest in frequency of pupils competent in subtraction followed by those in addition, multiplication and division. On the other hand, the highest frequency of pupils in Xing Guang and Ying Feng is in addition followed by those in subtraction, multiplication and division. Overall, the pupils of BSU and La Trinidad Central Schools perform best in subtraction of decimal numbers and poor in division; whereas, the pupils of Xing Guang and Ying Feng Elementary School perform best in addition and poor in division. The schools vary significantly in terms of the competencies of pupils in the four schools. Observation would also imply that the pupils are consistent in the area where they need to improve their competencies.

In solving problems using the four fundamental operations, the BSU pupils are consistent in their distribution, indicating that they excel better in word problems that are related to subtraction and division and low in addition and multiplication. Similarly pupils of Xing Guang and La Trinidad Central fare better in subtraction followed in decreasing order by division, addition and multiplication. The pupils of Ying Feng fare best in division followed by addition, subtraction and multiplication. The pupils the pupils fare significantly better in subtraction and division in the use of the four

fundamental operations in Mathematics in word problems as compared to subtraction and addition. Problem solving, according to Jenson (1998), is one best way to grow a better brain since this involves analysis and application of concepts. Ausrin et al (1997) concluded that problem solving results to greater intellectual curiosity.

Generally, the pupils in the four schools do not fare well in Mathematics as seen from their frequency distribution, which is below the mean distribution of 50 per area. The same finding was reported by Mapandol (1980): that children are most deficient in solving problems that involve whole numbers and rational numbers, percentages and measurements and that apply principles, rules and generalizations about perimeter and area. Piloten (1983) suggested that the difficulties in Mathematics is attributed to how a teacher maintains a classroom atmosphere that is conducive to learning and this can be seen through the classroom management capabilities of teachers. Other attributes are related to classroom inadequacies in the school system such as lack of textbooks and the lack of students' comprehension of the teacher's explanation due to unclear presentations Barab and Landa (1997)

The foregoing findings can be attributed to the task orientation and engagement in learning process. As stated by Elliot et al. (2000), when students' academic learning time is increased, their achievement improves. With improvement, students understand and correctly complete their work.

Overall, it is inferred that the pupils are competent in the use of the four

fundamental operations in all areas but non competent in the use of whole numbers and word problems.

Competencies of Grade VI Pupils
in other Areas

Table 16 shows that the pupils are significantly competent in transforming a number to percent. They are likewise competent in other areas, which, however, are below the acceptable mean frequency of 200 . these other areas include ratios, identifying measurement of angles, identifying solid objects, computing area of solid objects, other mathematical activities and ratio and proportion.

That the competencies of pupils along the varied areas are significantly differ, implies that they are proficient in transforming a number to a percent but not in other areas. Conversely, the schools significantly differ in the competencies of their pupils, where Ying Feng Road Elementary School is observed to be significantly highest in competency followed by Xing Guang, La Trinidad Central School and BSU Elementary Laboratory School. Manifestations of these are observed in the total frequency distributions of 307, 301, 253 and 209 respectively.

In a study, Mandali (1979) identified several factors that play significant roles in the achievement of students in Mathematics. Some of those identified by Santos (1980) were lack of textbooks, lack of intensive drill work, absence of remedial teaching, lack of interest of teacher and inability of students to comprehend and understand the different problems in Mathematics.

Table 16. Competencies of grade six pupils in learning other areas in Mathematics

COMPETENCY	SCHOOL				
	BSU	LTCS	XING GUANG	YING FENG	TOTAL
Ratio	48	30	48	50	176
Ratio and Proportion	19	36	34	34	123
Transforming a number to percent	47	48	65	61	221
Identifying a solid object	28	35	40	38	141
Identifying measurement of an angle	31	34	45	44	154
Computing an area of a solid object	16	35	38	40	129
TOTAL	189	218	270	267	

$F_{(\text{between area of competence})} = 10.60^{s}$ $F(0.05) = 2.16$

$F_{(\text{between schools})} = 6.47^{S}$ $F(0.05) = 2.92$

Relationship Between Socio-economic Profile of Teachers and Selected Variables

Table 17 reveals the factors affecting the teaching practice of mathematics teachers in terms of the extent of use of teaching approaches and methods, provision of activities to pupils in learning Mathematics and degree of need to improve teaching in Mathematics.

Age is significantly and negatively relates to the use of methods, teaching approach and provision of activities. This finding indicates that the younger the teacher

Table 17. Relationship between characteristics of Mathematics teachers and some selected variables

VARIABLE	CHARACTERISTIC	SCHOOL			
		BSU	LTCS	YFRES	XGES
Extent of use of Teaching Method	Age	-0.84^{S}	-0.90^{S}	-0.69^{S}	-0.90^{S}
	Gender	1.00^{S}	1.00^{S}	1.00^{S}	1.00^{S}
	Years in service	0.00	0.73^{s}	0.62^{s}	0.70
	Highest Educational Attainment	-0.93^{S}	-0.87^{S}	-0.84^{S}	-0.88^{S}
	Salary	0.69	-0.89^{S}	-0.79^{S}	-0.71^{S}
Provision of Activities	Gender	-1.00^{S}	1.00^{S}	1.00^{S}	-1.00^{S}
	Years in service	-0.49	-0.13	0.67^{S}	0.74^{S}
	Highest Educational Attainment	-0.80	-0.87^{S}	-0.84^{S}	-0.83^{S}
	Salary	-0.32	-0.89^{S}	-0.64	-0.61
Degree of need to improve teaching	Age	-0.96^{S}	-0.17	-0.29	-0.81^{S}
	Gender	-1.00^{S}	-1.00^{S}	-1.00^{S}	-1.00^{S}
	Years in service	-0.86^{S}	-0.02	-0.43	0.88
Extent of use of Teaching Method	Age	-0.76^{S}	-0.86^{S}	-0.67^{S}	-0.85^{S}
	Gender	1.00^{S}	1.00^{S}	-1.00^{S}	1.00^{S}
	Years in service	-0.58^{S}	-0.06^{S}	-0.63	0.77^{S}
	Highest Educational Attainment	-0.87^{S}	-0.87^{S}	-0.82^{S}	-0.80^{S}
	Salary	-0.77^{S}	-0.88^{S}	-0.78^{S}	-0.57

the higher the extent of use of methods and approach and provision of activities in Mathematics. It is therefore inferred from the results that age is a factor in determining the performance of teachers through use of teaching methods and approach and provision of activities. Similarly, age is significant and negatively related to the areas of needs by teachers in improving their teaching in Mathematics in BSU and Xing Guang Elementary Laboratory School but not significantly related to those of teachers in La Trinidad Central School and Ying Feng Road Elementary School. Gender is negatively and significantly related to the use of methods and approaches, provision of activities and areas needed to improve teaching of teachers. This finding means that female teachers have a higher extent of use of teaching method and approaches, provide more activities for learning and have a higher degree of need in improving their teaching in Mathematics than male teachers. Gender therefore affects teaching in terms of the aforementioned aspects. Such findings contradict the observation of Santos (1980) that sex does not affect learning, but corroborate the finding of Sorenson (1979) that sex is not a factor that determines the the differences in performance of learners in Mathematics.

Years in service is significantly and negatively related to frequency of use of teaching methods and approaches in LTCS and BSU; activities in YFRES and XGES; and degree of need in improving teaching Mathematics in BSU and XG Elementary School. The relationship indicates that those who are younger in service in the aforementioned schools have a higher extent of use of teaching methods and approach and provision of activities and higher degree of need in improving their teaching.

Furthermore, the younger teachers are more efficient in teaching and feel they to grow to become effective teachers as manifested by their need of improving their teaching.

Conversely, salary is a significant factor in the use of teaching approaches for all the schools involved in the study, and is significantly related to the use of methods for all the three schools except for BSU. In other words, those receiving lower salaries have a higher extent in the use of teaching methods and approaches and provision of activities because they are challenged to do better if they wish to be promoted.

Obtaining higher education significantly affects the teachers' extent of use of methods and approach in teaching and provision of activities, especially the younger teachers with only a bachelor's degree.

Generally, factors such as age, gender, educational attainment and salary significantly affect the use of teaching and approaches, provision of activities in teaching Mathematics and the need of improving their teaching the subject.

SUMMARY, CONCLUSIONS AND RECOMMENDATIONS

Summary

This study was conducted with the intent to compare the status of teaching Mathematics in selected schools in the Philippines and China. Specifically, the study aimed to determine the socio-economic profile of Mathematics teachers and grade VI pupils in the selected schools; to evaluate the extent of use of teaching approaches and methods in Mathematics; to determine the extent of providing activities to pupils in learning Mathematics; to identify the area of need of teachers to improve their teaching Mathematics; to determine the performance of students in Mathematics; to identify the specific area in Mathematics that the grade VI pupils are competent in; and to determine the relationship between the socio-economic profile of teachers and the extent of use of methods in teaching mathematics, teaching approach, extent of provision of activities in learning Mathematics, and degree of needs for improving their teaching.

The respondents of the study were taken from selected schools of La Trinidad, Benguet and Huai Hua City in China. Those schools selected as site of the study include BSU-Elementary Laboratory School, La Trinidad Central School, Ying Feng Road Elementary School and Xing Guang Elementary Laboratory School. A total enumeration of all Mathematics teachers teaching in the schools were drawn as teacher-respondents while 100 grade VI pupils were drawn as student-respondents. A descriptive survey was used in the study and a test was structured for gathering data about the performance and competencies of grade VI pupils.

The salient findings are the following:

1. The great majority of Mathematics teachers range in age from, 21 to 40 years in the four schools. The teachers are dominantly females. Almost all of them are bachelor's degree holders, and have been teaching for six to ten years. Their salary range from PhP 8,000 to above PhP 18,000.

2. The grade six pupils range in age from 11 to 12 years. Females dominate the males in the four schools . Most of their parents have blue or white collar job.

3. The teaching approaches frequently used are discovery, conceptual, process and unified. The process and conceptual approach is most frequently at BSU, an the unified approach is frequently used in the other three schools.

4. Varied teaching methods are used by teachers in teaching Mathematics. Most frequently used at BSU Elementary Laboratory School are activity method, inductive method and problem-solving method; at La Trinidad Central School are discussion, investigatory, integrated, problem-solving, and modular; at Ying Feng Road Elementary School are reporting, activity and investigatory; and at Xing Guang Elementary Laboratory School are those methods which are frequently of use in teaching Mathematics.

5. The teachers provide varied activities during the teaching learning process in Mathematics. However, Ying Feng Road Elementary School (YFRES) showed a very frequent provision of the activities in teaching Mathematics. The leading activity is

practice and drill, followed by giving quizzes. The use of traditional form of evaluation through a pencil-and-paper test is very common to all teachers.

6. The Mathematics teachers of BSU Elementary Laboratory School feel that to improve their teaching in Mathematics, they should attend in-service trainings and seminars, make modules, conduct action research, update current strategies, improvise teaching aids, use modern technology and use other textbooks.

Those in La Trinidad Central School feel that they have fewer needs to improve their teaching in Mathematics. Those in Yin Feng Road Elementary School feel that they need to attend in-service training and seminars, update of current strategies and improvise teaching aids. Those in Xing Guang Elementary Laboratory School feel the need to improve teaching aids and update current strategies in teaching.

7. The pupils in Ying Feng Road Elementary School have the highest performance in Mathematics, followed by those at Xing Guang Elementary Laboratory School, La Trinidad Central School and BSU Elementary Laboratory School. La Trinidad Central School have more low performing pupils. Conversely, BSU Elementary Laboratory School, Ying Feng Road Elementary School and Xing Guang Elementary Laboratory School have high performing group of pupils. The pupils are competent in addition of whole numbers and decimal numbers, and least competent in division of whole number. In using the same mathematical operation in fractions, all the pupils are most proficient in multiplication and least proficient for division. In using the fundamental operations in word problems, the pupils are more competent in solving

problems using subtraction and division than in using addition and multiplication. The pupils are proficient in transforming a number to percent and have shown competence in all the other areas but have not surpassed the acceptable criterion.

8. Age significantly and negatively relates to the use of methods, teaching approach and provision of activities; and gender significantly and negatively relates to the use of methods and approaches, provision of activities and areas needed to improve teaching of teachers. Years in service significantly and negatively relates to frequency of use of teaching methods and approaches in LTCS and BSU, activities in YFRES and XGELS; and degree of need in improving teaching Mathematics in BSU and XG Elementary Laboratory School.

Educational qualification significantly affects the teachers' extent of use of methods and approach in teaching and provision of activities. Salary significantly relates to use of methods and approaches in some schools except for BSU.

Conclusion

Based on the results, the following conclusions are drawn:

1. All the teaching approaches are used in teaching Mathematics but the schools significantly vary in the extent of use of the teaching approaches used in teaching Mathematics. Most applicable among teachers is the use of unified approach where they use the student vocabulary in the presentation of a topic in Mathematics. Relevant and concrete examples are needed in the teaching of Mathematics.

2. The teachers do not significantly vary in the extent of use of the teaching

methods in Mathematics. Differences in the extent of use of the method is likewise observed among the four schools.

The teachers are proficient in the use of the methods except for reporting. This shows that teachers promote the collaborative or cooperative learning in Mathematics.

3. Enhancement activities are provided but not frequently. Mastery learning is not much an emphasized in the teaching of Mathematics in the two schools in Mathematics as manifested by the low extent of providing the activity.

4. There is a need to increase more time for teachers to spend in classroom teaching for Mathematics. Textbooks are scarce and teachers lack research skills in all schools.

5. There is a need for pupils in all the schools to enhance their competencies using the four fundamental operations in Mathematics and other areas of learning. Age, gender, highest educational attainment and salary received by teachers are significantly and negatively related to the extent of use of teaching methods and approaches and provision of activities to pupils in learning Mathematics.

Recommendations

Based on the findings and conclusions, the following are recommended:

1. There is a need to improve the mathematical competencies of the grade VI pupils. This can be done by improving performance of teachers through the use of teaching methods and approaches.

2. Provision of trainings to upgrade the content and skills of teachers should be

addressed. While technology is one of the needs identified, teachers should be trained on the appropriate use of instructional media including technology.

3. The different phases of learning should be emphasized in teaching. A relearning process through in-service training is recommended where teachers should explore other approaches in teaching mathematics to grade VI pupils.

4. Instructional planning and designing among Mathematics teachers should include lesson clarity, instructional variety, task orientation and engagement in the learning process.

5. Further study is recommended to find out other factors affecting performance of teachers in Mathematics and the learning of pupils.

LITERATURE CITED

ABUBO, E. P. 1989. The Pupils Factors in the Mathematics Achievement of First year College students of Don Mariano Memorial State University. Unpublished thesis, Don Mariano Memorial State University, College of Arts and Sciences, Agoo, La Union.

AGLANO, A. M. 2002. Competencies of Students in Mathematics, Unpublished MA thesis. Benguet State University, la Trinidad, Benguet.

ALCORN, M.1964. Better teaching in secondary school. New York: Holt, Rinehart and Winston, Inc.

ALKEN, L.T. 1970. Attitudes Toward Mathematics. Review of Educational Research.

AUSTIN, ET AL. 1997. Effects of Thematically Integrated Mathematics Instruction on Students of Mexican Descent. Journal of Educational Research. 88(5), 290-300.

BARAB & LANDA. 1997. Collaboration Among Teachers, Researchers and In-Service Trainers to develop an Integrated Science Curriculum. Journal of Curriculum Studies. 30(6), 661- 676.

BAWANG, R. G. 1995. Difficulties in Elementary Mathematics of Grade Six Graduates Enrolled in State Universities and Colleges in the Cordillera Administrative Region. Unpublished PhD thesis, Benguet State Univeristy, La Trinidad, Benguet.

BERLINER, B. C. 1988. As cited by ELLIOT, S. N. et al. 2000. Educational Psychology: Effective Teaching, Effective Learning, 3rd Edition. Singapore: McGraw Hill Companies, Inc.

BORICH, G. 1992. As cited by Elliot, S.N. et al. 2000. Educational Psychology: Effective Teaching, Effective Learning, 3rd Edition. Singapore: McGraw Hill Companies, Inc.

BUSH, G.W. 2001. The No Child Left Behind Act. United States of America: American Board For Certification of Teacher Excellence. P. 6.

CARINO, I. D. 1992. Will Education Succeed?. Manila: Department of Education Culture and Sports. pp. 79-86.

CAET, J. D. 1979. An Appraisal of Elementary Mathematics Teachers in the Division of Pagadian City. Unpublished Ma thesis. Bukidnon State College, Bukidnon.

DRAKE, S.M. 1998. Creating Integrated Curriculum: Proven ways to Increase Student Learning. Thousand Oaks, C.A. Corwin Press.

DANTIS, S. A. 1982. Interrelationship of Academic Achievement Ability in Mathematics Sex, Attitudes Toward Mathematics of Fourth Year High School Students of Three Private Sectarian School in San Jose, Occidental, Mindoro, 1970-1971, Unpublished MA thesis. Centro Escolar University, Manila.

DELA, CRUZ de la, Pancho. 1992. Mathematical difficulties encountered by students of accelerated Christian education schools, Baguio City, 1991-92. Unpublished MA thesis, Baguio Central University, Baguio City.

DINAMLING, M. M. 1990. Mathematical Difficulties Encountered by the Students of Accelerated Christian Education. Unpublished MA thesis. Baguio Central University, Baguio City.

EDCOM, 1992. Point of View. Philippine Journal of Education.

ELLIOT, T.S. ET AL. 2000. Educational Psychology: Effective Teaching, Effective Learning, 3rd Edition. Singapore: McGraw Hill Companies, Inc.

FRANKLIN, G. 2004. Curriculum, Instruction and Assessment: A Report. United States of America: Glendale United School District.

GUERRERO, J. 1989. Te need for a revitalized teacher education. Diliman,Quezon City: National Bookstore Inc.

HUIRA, K. 2006. Science and Mathematics Education Manpower Development Annual Report. Philippines: Japan International Agency, University of the Philippines, Diliman, Quezon City.

JIA, GUO FU (August 11, 2006), A New Mathematics Teaching Process. Unpublished by Guang Zhou City 86th secondary school teacher.

BALINO, J.V. 1998. Selected Predictors of Performance of Students in Mathematics at the cordillera Career Development College.

KASER, J. S. 1999. Enhancing Program Quality in Science and Mathematics. California: Corwin Press, Inc.

KLEIN, J.T. 1996. Crossing Boundaries: Knowledge, Disciplinaries, and Inter-disciplinaries. Charlottesville and London: U of Virginia Press.

JENSON, J.R. 1998. Integrating Science, Mathematics, and technology in Middle Schoo Technology-Rich Environments: 'A Study of Implementation and Change'. School Science and Mathematics. 100(1),27-35.

LARDIZABAL,A.,et al., 1991. Principles and Methods of Teaching. Phoenix Publishing House Inc., Quezon City, Philippines

LEVAK, et al. 1993. ' Global Connections', Educational Leadership. 51(1), 73-75.

LUBRICA, P.A. 1996. The Teaching of Science and Technology in the Secondary School of Cordillera Administrative Region. Unpublished Doctorate Dissertation. La Trinidad, Benguet

MADALI, E. L. 1979. Guidance in the School. Quezon City: R. P. Garcia Publishing Co.

MAPANDOL, P. M., 1980. Causes of Low Performance of Grade Six Pupils in Mathematics in Bauko District, division of Mountain Province, Unpublished MA thesis, Baguio Central University, Baguio City.

MARRERO, E.L. 1989. Remedial Measures on Problem-solving in Mathematics IV in the Public Secondary School in Benguet. Unpublished MA thesis. Baguio Central University, Baguio City.

MAZON, T. C. 1982. A Study of the Difficulties of Grade VI Pupils in Problem-solving in Arithmetic in the Province of La Union. Unpublished MA thesis. Northern Educational Institute, Dagupan City.

OASAN, N. D. 1983. The relationship Between the NCEE Scores of the University of Baguio College Freshmen and Their Ratings in College Algebra. Unpublished MA thesis. University of Baguio, Baguio City.

OCAMPO, V. 1987. The performance aoooraised system for teachers as implementaed by the division of Benguet. Unpublished PhD disseration, Saint Louis University, Baguio City.

PILAR, E. C. 1989. Determinants of Academic Performance in Mathematics. Unpublished MA thesis. Northwestern College, Laoag City.

PILOTEN, P. V. 1983. Difficulties and Attitudes of Fourth Year High School Students Regarding Mathematics. Unpublished MA thesis. Baguio Central University, Baguio City.

RAMOS, Z. J. 1983. Factors Influencing Academic Achievement in Mathematics of Grade VI Pupils ar Araulli Lyceum, Cabanatuan City. Unpublished MA thesis. Araulo Lyceum, Cabanatuan City.

SALANDANAN, G, et al. 1988. The Teaching of Science, and Health, Mathematics, and Home Economics, and Practical Arts. Teaching Strategies III. Philippine Association for Teacher Education. Katha Publishing Co., Inc. Quezon City.

SALAMONIS, B. L. 1970. Methods and Materials in Today's High School' . New York: Van ROstrand Reinhold.

SAMBRANO, G. and RIVERA, F. 1982. Toward Effective Teaching. Quezon City: Golden Art Publishing Crop.

SANTOS, A. A. 1980. A Comparative Study of the Mathematical Ability of Boys and Girls. Unpublished MA thesis. Abad Santos Educational Institution, Manila. P. V.

SERION, J.R. 1980. Our Contemporary Mathematics Program, New Thrusts in Philippine Education. Current Events Digest Inc.

SORENSON, S. J. 1979. Psychology in Education. New York: Addison-Wesley. STA.

TATING, A. Y. 1993. UNESCO'S Role in teacher development. The Modem teacher.

TOLEDO, M. 1982. In-service Training needs perceived by Mathematics Teachers of Mountain State Agricultural College. Unpublished MA thesis , University of the Philippines, Diliman, Quezon City.

WEN, J. 2005. How to Improve The Students Interest in Learning Mathematics. Chines Mathe Research. China.

WU GUITI's (2006), Impress Math and Experience Math. Unpublished report by Wen Xin Elementary School Grade I Mathematics Teacher.

YI MING (2005), How to Develop the Student Interest in Learning Math. Unpublished Master Thesis. East of China Normal University.

Zhu, Z. 2002. Functioning Modes of Information Technology in Classroom Instruction: A report. China: East Normal University.

1. http://www.English.people.com.cn/English
2. http://www.weordstatting.com/onfo/teach/sample/resume.com
3. http://www.amth.about.com/cs/reference/a/discalcula.htm
4. http://www.pep.com
5. http://www.goal.com

APPENDICES

APPROVAL LETTER

Republic of the Philippines
College of teacher Education
BENGUET STATE UNIVERSITY
La Trinidad, Benguet

August 4, 2006

ELADIO O. LAPICTO, Ed.D.
Prinicipal
Elementary Laboratory School
Benguet State University
La Trinidad, Benguet
Dear Sir,

The undersigned is taking up Master of Arts and Education, major in Educational Administration and Supervision at the Benguet State University and at present conducting a research study titled "LEVEL OF MATHEMATICS COMPETENCIES AMONG GRADE VI PUPILS IN SELECTED SCHOOLS OF LA TRINIDAD, BENGUET, PHILIPPINES AND HUAI HUA CITY, HUAN, CHINA: A COMPARATIVE STUDY" in partial fulfillment of the requirements for the degree.

Related to this, may I request that I will be allowed to conduct my research in your Department. Rest assured that the information supplied will be treated confidentially.

Thank you very much.

Sincerely yours,

(Sgd) WUZHEN SHU
Researcher

Noted by:

(Sgd) PERCYVERANDA A. LUBRICA, PhD.
Adviser

(Sgd)TESSIE M. MERESTELA, D. Agr.
Graduate School Dean

Republic of the Philippines
College of Teacher Education
BENGUET STATE UNIVERSITY
La Trinidad, Benguet

August 4, 2006

ANDRES L. PAWID
Principal
La Trinidad Central School
Poblacion, La Trinidad, Benguet

Dear Sir,

The undersigned is taking up Master of Arts and Education, major in Educational Administration and Supervision at the Benguet State University and at present conducting a research study titled "LEVEL OF MATHEMATICS COMPETENCIES AMONG GRADE VI PUPILS IN SELECTED SCHOOLS OF LA TRINIDAD, BENGUET, PHILIPPINES AND HUAI HUA CITY, HUAN, CHINA: A COMPARATIVE STUDY" in partial fulfillment of the requirements for the degree.

Related to this, may I request that I will be allowed to conduct my research in your Department. Rest assured that the information supplied will be treated confidentially.

Thank you very much.

Sincerely yours,

(Sgd) WUZHEN SHU
Researcher

Noted by:

(Sgd) PERCYVERANDA A. LUBRICA, PhD.
Adviser

(Sgd)TESSIE M. MERESTELA, D. Agr.
Graduate School Dean

TEACHER'S QUESTIONNAIRE

I. Please provide the necessary information as indicated.

Name (optional): _____ Date:_____

Age: _____ Gender: ____Male ____Female

Nationality: _____ Cultural/ Ethnic Background: _____

Highest educational attainment: _____

Number of years in teaching Mathematics: _____

Range of salary: Please check.

P8,000-P10,000 ___ P10,001-P12,000___ P12,001-P14,000 ___

P41,001-P16,000___ P16,001-P18,000___ more than P18,000___

II. Directions: The following are approaches employed in teaching Mathematics. Please put a check mark under the appropriate column using the following scales.

4 – Frequently utilized (76% - 90% Used in most instruction)

3 - Often utilized (50% - 75 % used in instruction)

2 – Seldom Utilized (less than 50% used in instruction)

1 – Not used

TEACHING APPROACH	4	3	2	1
1. Stress on the learning of concepts theories, principles and content through discovery.	____	____	___	___
2. Finding of the unknown including all forms of obtaining knowledge by use of one's own mind	____	____	___	___
3. Deriving a concept or principle using mental processes	____	____	___	___
4. The instruction is designed to make the students discover rules or principles in math.	____	____	___	___
5. The lesson is designed such that the students are taught the concepts leading them to discover rules or principles.	____	____	___	___
6. The students are taught the content from simple to complex.	____	____	___	___
7. The students are guided to organize their data from simplified to complex level in the form of graphing, tables, diagrams and figures.	____	____	___	___
8. The students are taught where knowledge is the main concern of the teacher.	____	____	___	___
9. The student are taught focusing on the development of their skills	____	____	___	___
10. The teacher is able to determine the weaknesses of the student in their skill formation.	____	____	___	___
11. The teacher questions more and tells less.	____	____	___	___
12. The student is made to learn in search of truth information or knowledge.	____	____	___	___
13. The student is taught to search for the solution of a problem through exploration and evaluation.	____	____	___	___
14. Teacher reinforces previous learning.	____	____	___	___
15. Presentation of topic of subject is geared to student vocabulary level.	____	____	___	___
16. Knowledge is expanded through citation of relevant example and concrete situation.	____	____	___	___
17. Others (please specify)				

III. Directions: The following are methods used in teaching Mathematics.

Please put a check mark under the appropriate column using the following scales.

4 – Frequently utilized (76% - 90% Used in most instruction)

3 - Often utilized (50% - 75 % used in instruction)

2 – Seldom Utilized (less than 50% used in instruction)

1 – Not used

TEACHING METHOD	4	3	2	1
1. The students are provided with needed information by factual presentation and textual explanation of a particular topic (Lecture Method)	____	____	___	___
2. Students are guided to give a free exchange of ideas about a particular topic (Discussion Method)	____	____	___	___
3. Students are allowed to search for information about a given topic and report it in class (Reporting Method)	____	____	___	___
4. Teacher shows a step by step presentation through concrete actions and materials of which the students will observe (Demonstration Method)	____	____	___	___
5. The students are engaged in the activity to have a first hand experience about the concept being learned (Activity Method)	____	____	___	___
6. The students are taught starting from the known to the unknown; from the specific to the general; from the particular to the universal; from simple to complex; and from the concrete to the abs tract (Inductive Method)	____	____	___	___
7. The teacher begins teaching from a generalization and subsequently gives examples and specific situations that are supportive of it (Deductive Method)	____	____	___	___
8. Students are required to do an experiment, conduct an investigation, try out different alternatives to solve a given problem (Investigatory Method)	____	____	___	___
9. Students' individual differences are recognized by giving the student the freedom to set his own schedule for learning and to monitor his own progress while the teacher acts as a consultant (Self-pacing Method)	____	____	___	___

10. The teacher uses textbook learning, rote learning, directed technique' and memorization (Traditional Method)	____	____	___	___
11. The students are made to focus on sets of questions which are answered from reading books and other printed materials. They share their insights and answers during the class session. (Recitation Method)	____	____	___	___
12. Teacher combines two or more subjects to explain a main topic. One is a springboard and the other is the main topic. Other subject areas could be supportive to the main topic. (Integrated Method)	____	____	___	___
13. Teacher sets a good criteria for students to come up with a solution (Problem-solving Method)	____	____	___	___
14. Students are given a self-contained and independent unit of instruction with specific objectives. The student is given an opportunity to know the specific objectives and do the learning activities by following specific procedures. (Modular Method)	____	____	___	___
15. Students are given interesting homework that requires a little research or participation and assistance from family members (Assignment Method)	____	____	___	___
16. Students are required to practice and master important prerequisite skills necessary for the whole lesson. Constant review is necessary. (Practice and Drill Method)	____	____	___	___
17. Others (please specify)				
_____	____	____	___	___
_____	____	____	___	___

IV. What are the activities provided in learning Mathematics? Please Check:

Scale: 5- Very Frequently Utilized

4 - Frequently Utilized

3 -Moderately Utilized

2 - Seldom Utilized

1- Not Utilized

	(5)	(4)	(3)	(2)	(1)
a. Recitation	___	___	___	___	___
b. Problem-solving	___	___	___	___	___
c. Board work	___	___	___	___	___
d. Assignment/ homework	___	___	___	___	___
e. Quizzes	___	___	___	___	___
f. Tests/ examinations	___	___	___	___	___
g. Discussion with classmates	___	___	___	___	___
h. Discussion with teacher	___	___	___	___	___
i. Solving modules	___	___	___	___	___
j. Memorization	___	___	___	___	___
h. Drawing & paper cutting	___	___	___	___	___
i. Others (please specify)	___	___	___	___	___

V. Please check the areas that needed Improvement.

Scale 4- very much needed

3- much needed

2- needed

1- not needed

	(4)	(3)	(2)	(1)
a. attendance to in-service training	___	___	___	___
b. attendance to seminars	___	___	___	___
c. making modules	___	___	___	___
d. upgrade subject content	___	___	___	___
e. conduct action research	___	___	___	___
f. learn current teaching strategies	___	___	___	___
g. improvise teaching aids	___	___	___	___
h. include modern technology	___	___	___	___
i. addition teaching time	___	___	___	___
j. availability of appropriate textbooks	___	___	___	___
k. others (please specify)	___	___	___	___

PUPIL'S QUESTIONNAIRE

I. Please provide the necessary information as indicated

Name (optional): _____

Date:_____

Gender: ____Male ____Female Age: _____

Cultural/ Ethnic Background: _____Nationality: _____

Parent's Occupation:

Father's Occupation: _____

Mother's Occupation: _____

II. Instruction: The following are mathematical problems. Please circle the correct answer.

A. Mathematical Equations on Whole Numbers, Fractions and decimals.

1. 6,387 + 2,339 =

a. 8,726 b. 8,716 c. 8,626 d. not given

2. 762 + 219 =

a. 1,081 b. 981 c. 971 d. not given

3. $\frac{7}{8}+\frac{5}{8}+\frac{3}{8}+\frac{1}{8}=$

a. $1\frac{7}{8}$ b. $1\frac{3}{8}$ c. 2 d. $2\frac{1}{8}$

4. $1\frac{2}{3}+\frac{3}{4}+\frac{1}{4}=$

a. 2 b. $2\frac{2}{3}$ c. $1\frac{1}{4}$ d. $2\frac{1}{2}$

5. 0.75

<u>+0.1391</u>

a. 0.9891 b. 0.8891 c. .01466 d. 0.1371

6. 4.5980
+ 7.8165

a. 12.4045 b. 12.4145 c. 11.4145 d. 12.3145

7. 8 754 935 - 1 320 412 =

a. 7,434,523 b. 7,434,423 c. 7,424,523 d. not given

8. __– $^{3}/_{10}$=5

a. $^{8}/_{10}$ b. ⅔ c. $5^{3}/_{10}$ d. not given

9. 0.704
-0.019

a. 0.795 b. 0.685 c. 0.785 d. not given

10. 9.57128
-2.89340

a. 6.85788 b. 6.58778 c. 6.86788 d. not given

11. 493 202
x 87

a. 42,908,574 b. 42,908,476 c. 42,907,574 d. not given

12. 6 138 76
x 354

a. 217,312,114 c. 217,213,104

b. 217,312,104 d. not given

13. $^{1}/_{9}$ x 3 =

a. $^{3}/_{27}$ b. ⅓ c. 3 d. not given

14. 9 ⅓ x 30=

a. 300 b. 372 c. 280. d. not given

15. 0.976 x 6.9 =

a. 7 b. 6 c. 10 d. not given

16. 182 ÷ 40 =

a. 4.55 b. 40.55 c. 4.5 d. not given

17. 1⅓÷ 7=

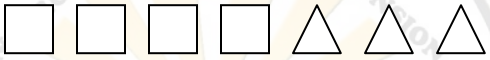
a. 7⅓ b. ⅞ c. ¾ d. not given

18. 234.6 ÷10 =

a. 2346.0 b. 0.2346 c. 2.346 d. not given

B. Ratio:

19. Given the illustration, which gives the correct ratio?



a. 3:4 b. 5:6 c. 4:3 d. not given

20. Given the illustration, which gives the correct ratio?

a. 7:8 b. 6:5 c. 6:4 d. 4:6

C. Ratio and Proportion:

21. 0.75= %= 12

a. 75 & 9 b. 25 & 10 c. 0.75 & 100 d. not given

22. 0.50 = ( ) %=( ) :14

a. 20 & 14 b. 0.5 & 7 c. 50 & 7 d. not given

D. Percentage

1. ½

a. 20% b. 40% c. 50% d. not given

2. ¼

a. 20% b. 25% c. 50 d. not given

3. ⅜

a. 30%. b. 37.5% c. 68% d. not given

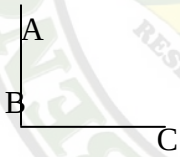
E. Geometry

1. What kind of triangle is this?

a. right triangle b. equilateral triangle

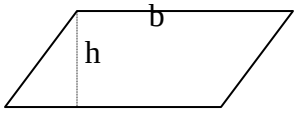
c. Scalene triangle d. Isosceles triangle

2. What is the measure of the angle?



a. 180° b. 90° c. 45° d. not given

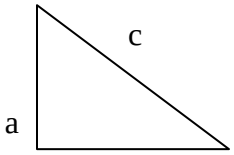
3. The quadrilateral b=46cm, h=34cm. what is the area of the quadrilateral?



a. 80cm² b.1564cm²

c. 782cm² d. not given

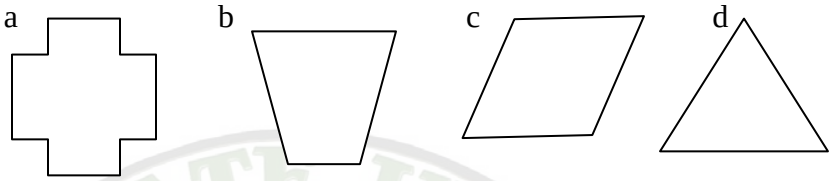
4. What is the area of the triangle? (a=12cm b=12cm)



a. 24cm² b. 72cm²

c. 144cm² d. not given

5. Which polygon is a trapezoid?



F. Problem Solving：

1. Alan ordered a model car hit for $27.98, a model boat kit for $22.79, and a model airplane kit for $30. What was the total amount of his order?

   a. $79.67 b. $51.07 c. $80.77 d. not given

2. A lager theater has enough seats for 1,050 people. If 875 people attend a show, how many empty seats are there?

   a. 285 b. 175 c. 185 d. not given

3. Marco plans to take a 2-hour typing lesson 3 days a week. He will take the lessons for 12 weeks. How many hours of lessons will he take in all?

   a. 36 b. 84 c. 72 d. not given

3. What is the quotient when 35.46 is divided by 3?

   a. 12 b. 32.46 c. 11.82 d. not given

BIOGRAPHICAL SKETCH

Wuzhen Shu was born in Huai Hua City, Hu Nan Province, China on January 19, 1975. She is the fifth out of six children in her family.

She finished her elementary education at Tian Wan Central Elementary School in July 1989. She finished her Middle School Education at Tian Wan Middle School in July 1992 and her high school at Chen Xi No. 2 Secondary School in July 1995. She received her college degree of Bachelor of Science in Elementary Education at Hu Nan Teachers University in July 1998. She finished a second degree, Business Administration, from the International Studies Institute, Zhong Jiang Branch, Nan Jing City, Jiang Su Province, China in March 2004.

She taught Chinese Language to grade I-IV pupils. She stopped teaching and was employed at Guangzhou Television Station in the Editorial office as a TV play editor. She spent time to learn how to work well in this job. She learned the art of dealing with clients and shots advertisements, etc. After three months of hard work, she earned her first advertisement. The proceeds of the advertisements went to the education of poor children. She loves to do a kind of job that could help others in need.

She finished her degree in Master of Arts in Education major in Educational Administration and Supervision at Benguet State University, La Trinidad, Benguet, Philippines.