Factors Affecting the Mathematics Problem Solving Skills of Filipino Pupils

A Study Conducted in Kiamba Central School SPED Center, Kiamba, Sarangani

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Abstract **-** Striving for excellence in Mathematics attracted the researcher to determine the factors affecting the mathematics performance of Kiamba SPED Center pupils. Descriptive-correlation study was conducted in order to determine the level of the pupils' mastery in math basic skills, attitude towards mathematics and their parents' involvement in learning, and which of these factors have significant relationship with problem solving skills. Respondents were the Grades lV, V, and Vl pupils of Kiamba Central School SPED Center, consisting of 95 pupils from the Fast-Learner section. The instruments used were the Basic Skills Test, the Attitude Scale Test, Parental Involvement Questionnaire and the Problem Solving Test. Numerical scores were assigned to responses in the five-point Likert Scale in the Attitude Scale, and the mean score subsequently computed. Chi-square test was used to determine the significance of the relationship between the pupils' problem solving skills and the three factors tested.

The result of the study showed that there is a significant relationship between the problem solving skills and the pupils' mastery of basic skills, attitude towards mathematics, and parental involvement.

Index Terms - Factors Affecting, Mathematics, Problem Solving Skills, Kiamba SPED Center

I. INTRODUCTION

The present study sought to find out the relationship of selected variables believed to have significant bearing on the mathematics performance of pupils. The framework of the study focuses on mastery of basic skills and attitude towards mathematics as pupil factors and the parents' involvement in their children's learning activities as parent factor that may affect the problem solving skills of the pupils.

Significance of the Study

An important objective in teaching mathematics is to develop students' mathematical problem-solving skills. The researcher, a Mathematics Coordinator, considers this endeavor to be of help to school administrators, teachers, parents, and pupils in improving the mathematics performance of learners and to other future researchers.

Research Questions

The study sought to answer the following questions

1. What is the demographic profile of pupils in terms of:
    1.1. Basic Skills Test: and,
    1.2. Attitude Scale Test?
2. What is the demographic profile of the parents in terms of Parental Involvement in the pupil learning?
3. What is the extent of the pupils' problem solving skills?
4. Is there a significant relationship between the pupils' problem solving skills and the pupil faders when analyzed according to:
    4.1. Basic skills; and.
    4.2. Attitude?
5. Is there a significant relationship between the pupils' problem solving skills and the parent factor when analyzed according to Parental Involvement?

Hypotheses

$H_0$1: There is no significant relationship between the pupils' mastery of basic skills and the pupils' problem solving skills.

$H_0$2: There is no significant relationship between the pupils' attitude towards mathematics and the pupils' problem solving skills.

$H_0$3: There is no significant relationship between parental involvement and the pupils' problem solving skills.

Definition of Terms

For better understanding of the concepts and terms in this study, the following words are defined operationally.

Attitude is used to mean the pupil's interest in mathematics, like or dislike of the subject. In this study, it was measured using the Attitude Scale Test. A pupil's attitude may be highly positive, positive, fair, negative or highly negative.

Basic skills, operationally is used to refer to the pupil's ability to use the four fundamental operations in whole numbers, decimals, fractions, and percentage. In this study, it was measured with the Basic Skills Test.

Parent Involvement is used to refer to the activities and behavior of parents that support the pupils' learning process.

Performance level is the quotient of the grade IV, V, and VI pupils' score divided by the perfect score and then multiplied by 100. This is then categorized as Mastered, Nearly Mastered, and Not Mastered based on the standard set in the National Achievement Test given annually to Grades III and VI.

Problem solving is the process used to obtain a solution to a mathematics question. In this study, it is measured with the Problem Solving Test.

Pupil Factors refer to the characteristics or attitudes of the pupils that influence them to develop or hinder their mastery of the basic mathematics skills.

SPED Center pupils are the Grades IV, V, and VI pupils belonging to SPED Fast-Learner section of Kiamba Central School SPED Center.

II. REVIEW OF RELATED LITERATURE

Related Local Studies

Buan (1997) tested other variables possibly related to mathematics achievement and attitude. It was aimed to compare the effects of cooperative and individualistic instructions on student's achievement in mathematics and their attitude towards the subject. It was found that there is a significant difference in the pre-test and posttest scores of the cooperative group in the achievement test and attitude scale. In the individualistic group there is a significant difference in the pre-test and post-test achievement scores only but there is no significant change in attitude scores.

Angay's (1998) research work on pupils' difficulties in basic operations involving fraction concluded that the pupils performed poorly in the four fundamental operations of fractions. Moreover, the finding showed that there is a significant difference between the pupils' achievement and their parents' educational attainment.

According to Lucero (1999), parental involvement was significantly correlated with both pupils' mathematics achievement and attitudes. Mathematics achievement was significantly correlated with both father's education and mathematics attitudes; while mathematics attitude was significantly correlated with parents' monthly income.

Bigornia (2000) determined the factors affecting the mathematical proficiency level of Grade VI pupils. Teacher competence, pupils' background and communication skills were found to have highly significant relationship with pupils' mathematics achievement.

A study conducted in Lanao del Norte by Caliao (2000) aimed to determine the factors associated with the pupils' ability to solve problems in mathematics by associating pupils' mathematics achievement with the following factors: home environment, quality of mathematics instruction received by the pupils, pupils' attitude towards mathematics, mental ability, and reading comprehension ability. The factors identified to be significantly associated with the pupils' mathematics achievement were the following: fathers' education, neighbours, friends and relatives who took care of the child, buying things of educational value, teachers' profile such as number of math seminars attended, number of years in teaching math, number of awards received, lesson plan preparation, teachers' activity like conducting review classes, coaching during math competitions, encouraging and supporting pupils to participate in math competitions and the number of skills taught, mothers' hours spent at home and at work, mental ability, and reading comprehension.

Montecalvo (2000) assessed the problem solving skills and attitude in Mathematics of Grade Six pupils in Linamon District, Division of Lanao del Norte during the school year 1999-2000. Results show that majority of the pupils had average performance in problem solving skills along fractions, decimals, and percentage. Likewise, they had a fair attitude level towards mathematics and perceived that mathematics is useful for problems in everyday life. Furthermore, significant relationship existed between pupils' performance in problem solving skills test and type of school as well as pupils' average grade in Mathematics. Finally, no significant relationship existed between pupil’s performance in problem solving skills test and the following pupil-related factors, namely: family income, size of family, and attitudes toward mathematics.

Cañete's (2002) study determined the teacher and pupil factors affecting problem solving difficulties in mathematics. It concluded that pupils had satisfactory performance in basic skills test and fair attitude toward Mathematics but low performance in Problem solving achievement test. A significant relationship existed between pupils' problem solving skills in Mathematics and some teacher factors, namely, educational qualification, and possession of master's units/degree, specialized training, performance rating and strategies in teaching math. No sufficient evidence was seen to show significant relationship between pupils' skills in Mathematics and the pupil factors, mothers' educational attainment and family annual income.

Silva et al (2006) investigated the factors associated with non-performing Filipino students in mathematics in selected accredited schools in the Philippines (private and public institutions from Metro Manila and provinces). Results showed that, though the students have average mental ability, they encounter difficulties attributed to reading deficiencies and learning styles.

Lee-Chua (2006) discussed efforts spearheaded by various groups to develop a successful problem-solving culture. "We have learned to focus on certain critical variables". According to the researcher, these variables include: extensive parental support, early exposure, mental toughness, excellent master teachers, and good textbooks.

Alvaera, Bayan, & Martinez (2009) of De LaSalle University, Manila, conducted study intended to determine whether parental involvement and autonomy (mothers and fathers), and teaching approach can predict public school students' achievement as measured by the general average grades of students. In determining which variable has a significant relationship with student achievement, it showed that mother involvement was significantly related with the students' academic achievement. Of all the predictors of achievement used by the researchers, it was only mother involvement that had significantly predicted student achievement. This does not mean that teaching approach, father involvement, father autonomy and mother autonomy does not contribute in predicting achievement. This simply implies that their contribution in the achievement of the students is not as significant as compared to the contribution of mothers' involvement. The current study focuses on academic achievement as measured by the general average grade of the student from the previous grading period. It has been well established how academic achievement is influenced by a particular factor. Parents' involvement in the child's schooling like assisting the child's in making their assignments explains much the grade of the child. It was concluded in the study that only mother involvement can predict students' achievement.

Rondez (1997) studied grade six pupils in Iligan City wherein she attempted to associate high achievement in mathematics with the following factors: home environment, quality and quantity of math instruction received by pupils, and pupils' attitude towards math. The factors significantly associated with high achievement in math are the following: pupil respondents' father's educational attainment, number of influencing household member, seminars attended and math awards received by the teacher respondents, and pupils' attitude towards math. This indicated that pupils' academic achievement not only in Mathematics but also with other subjects is greatly influenced by other factors not only pupil and parent factors.

Related Foreign Studies

Basic Skills

According to Lightner (1999), researches show an abundance of people have voiced fears in regard to the socioeconomic impacts resulting from the low academic skills of today's employees. Studies also recognize the workplace trend, of demanding ever increasing levels of mathematics, communication, and science skills from the employees.

Gallo & Johnson (2008) administered a test of basic math skills to 696 students enrolled in various college economics courses in order to understand the factors influencing a student's ability to apply basic math skills in practical settings. Students with strong elementary math skills perform significantly better in applied contexts and that taking more math classes in college improves a student's ability to apply mathematics substantially. One of the major conclusions of their paper is that among the controls for mathematical background, mastery of very elementary math skills as measured by performance on their administered exam is of utmost importance. The results of their research pointed out that a substantial number of students lack the mastery of very elementary math concepts. Hence, they suggested that professors identify students with weak basic math skills early on so that some type of remediation can be done to bring these students up to par (Gallo & Johnson, 2008).

According to Math Fluency (2011), educators and cognitive scientists agree that the ability to recall basic math facts fluently is necessary for students to attain higher-order math skills. The implication for mathematics is that some of the sub-processes, particularly basic facts, need to be developed to the point that they are done automatically. If this fluent retrieval does not develop then the development of higher-order mathematics skills- such as multiple-digit addition and subtraction, long division, and fractions - may be severely impaired. Indeed, studies have found that lack of math fact retrieval can impede participation in math class discussions, successful mathematics problem-solving, and even the development of everyday life skills. And rapid math-fact retrieval has been shown to be a strong predictor of performance on mathematics achievement tests.

Attitude

Little consensus exists in the research literature concerning the relationship between attitude toward mathematics and achievement in mathematics. The variable "attitude" is one of the most potent factors that relates to achievement. In general, attitudes, beliefs and emotions are the major descriptors of the affective domain in mathematics education. Rather than attempt to explain all the components of the affective domain, mathematics educators have traditionally taken the relationship between attitude towards mathematics and achievement in mathematics as their major concern (Ma & Kishor, 1997). Also, Gomez-Chacon (2000) found that one of the variables with most influence on mathematics teaching and learning relate to the pupils' attitude, their perspective on the world of mathematics, and their social identity. Nicolaidou & Philippou (2003) explored the relationship between attitude towards mathematics, self-efficacy beliefs and problem solving and achievement of fifth-grade pupils and found significant relationship between attitude and achievement. Ignacio et al (2006) analyzed the beliefs, attitudes, and emotional reactions that students experience in the process of learning mathematics. The aim was to be able to demonstrate that the existence of positive attributes, beliefs, and attitudes about themselves as learners are a source of motivation and expectations of success in dealing with this subject. Basing on the results of his finding, he recommended establishment of projects and programs of prevention and intervention in difficulties of mathematics learning, and of emotional education in this area of knowledge. The aim will be to stimulate the attraction and taste for mathematics, and to improve attitudes, beliefs, and the emotional reactions that pupils experience when they are learning it.

Tella (2007) investigated the impact of motivation on students' school academic achievement in mathematics in secondary schools. The result indicates significant difference when extent of motivation was taken as variable of interest on academic achievement in mathematics based on the degree of their motivation. Highly motivated students perform better academically than the lowly motivated students. The issues of motivation of students in education and the impact on academic performance are considered as an important aspect of effective learning. However, a learner's reaction to education determines the extent to which he or she will go in education. The impact of motivation on education of mathematics of a child cannot be undermined.

According to Effandi & Normah (2009), students' attitudes towards mathematics are closely related to their attitude towards problem-solving in general; negative attitudes need to be overcome, so that students will not suffer from poor problem-solving skills later in life. Olatunde (2010) opined that the process of learning depends not only on family factors but also of students' personal characteristics that are naturally correlated with family characteristics but have an effect on their own. Therefore, in order to analyze achievement, some students' personal characteristics must be taken into account.

The research of Mohd, Mahmood & Mohd (2011) entitled "Factors that Influence students in Mathematics Achievement" revealed that there is significant relationship between the level of patience towards problem-solving and mathematics achievement. It also reflects that there is significant relationship between attitude towards problem solving and mathematics achievement. On the other hand, the finding shows that there is no significant relationship between the level of confidence and willingness towards problem solving and mathematics achievement. This research also reflects that there is significant relationship between attitude (patience, confidence and willingness) towards problem solving and mathematics achievement.

According to Manoah (2011), attitude towards mathematics has been considered an important factor in influencing participation and success in mathematics. In their study "Influence of attitude on performance of students in mathematics curriculum", it is worth noting that the independent variable (Attitude) for girls and boys had significant association with dependent variable (Mathematics Test.).

Parental Involvement

According to Hoover-Dempsey & Sandler (1995), parental support for student achievement as well as parental involvement in school activities has had positive impact in student academic success. A review of Walberg & Paik (2000) on dozens of studies had shown that home environment has a powerful effect on what children and youth learn within and outside school. This environment is considerably more powerful than the parents' income and education in influencing what children learn in the first six years of life and during the twelve years of primary and secondary education. They stressed that one major reason that parental influence is so strong is that from infancy until the age of 18, children spend approximately 92% of their time outside school under the influence of their parents.

According to Henderson & Mapp (2002), the evidence is consistent, positive, and convincing: families have a major influence on their children's achievement in school and through life. Studies have linked parental involvement with student benefits of higher grades and test scores, enrollment in more challenging academic programs, increases in the number of classes passed and credits earned, better attendance.

Rongjin & Leung (2002) studied the parental influence on Chinese children's mathematics teaming and found out that parents held very high expectations for their children's education and highly involved themselves in their children's mathematics, irrespective of their educational background and social economic status.

Cai (2003) investigated the roles parents in the United States of America and parents in the People's Republic of China play in their children's mathematics leam1ng. It also examined the relationship between parental involvement and students' mathematical problem-solving performance. The results of this study support the argument, from a broader cross-national perspective, that parental involvement is a statistically significant predictor of their children's mathematics achievement. Cross-nationally, Chinese parents seemed to play a more positive role than do the US parents (Cai, 2003).

Deutscher & lbe's (2004) project examined the role that parent involvement has on 7tt1 through 11th graders in a large rural area in Southern California. Various types of parent involvement were assessed, including volunteering, home involvement, attending parent classes, school political involvement, talking to staff, talking to teachers, etc. Academic performance was measured by STAR test scores and by grades. Overall, the results indicated that those who did the self-report survey, went to the parent class, or were involved in more home-type involvement (such as checking child's planner, talking to child at home about school-related topics, or engaging in educational activities outside of school) had children that performed better in various areas of the STAR test or had better grades. Parent involvement has been shown to be an important variable that positively influences children's education.

Cao et al (2006) conducted an investigation that explored the differences and similarities in parents' influence on students' mathematics learning as perceived by different groups of students in China and Australia. The result showed that parents play an important role in influencing students' mathematics reaming, but parents from different cultural backgrounds and in different societies may influence their students' reaming differently. (Cao et al, 2006).

According to Jackson & Eipstein (2006), over the past 15 years, there has been a simultaneous increase in the attention given to the role of parental involvement in education. Federal, state, and local governments have mandated that districts make efforts to involve parents. However, there has been no research as to the roles these curricular materials actually afford for parents with regard to their children's homework.

The Australian Council for Educational Research (2008) reported that literature review indicates that strong partnerships between schools, parents, businesses and local community organizations can make a significant difference to outcomes for young people. Research shows a range of positive outcomes associated with school-community partnerships, including increased skills, greater engagement with learning, more positive attitudes, and improved transitions into the workforce, further education or training (Schools First, 2008).

Olatoye & Agbatogun (2009) stated that the term "Parent involvement includes several different forms of participation in education and with schools and that experts in the field agree about the importance of linkages between families and school. Their study that investigated the achievement of pupils in the public and private primary schools in mathematics and science showed that showed that parental involvement is an important predictor of mathematics and science achievement. Also, Le Faivre's (2009) final report stressed that parent involvement in mathematics and the positive behaviors and skills parents can foster in the home to help students succeed in mathematics.

A new study by researchers at the University of Leicester and University of Leeds has concluded that parents' efforts towards their child's educational achievement is crucial – playing a more significant role than that of the school or child. The researchers found that parents' effort is more important for a child's educational attainment than the school's effort, which in turn is more important than the child's own effort (De Fraja & Zanchi, 2010). Finally, Bouffard & Weiss (2011) in the Harvard Family Research Project remarked: "Thanks to decades of high-quality research, there remains little doubt that families play a crucial role in their children's school success".

III. METHODOLOGY

This section presents the research design, instruments, procedure, and statistical tools of the study.

The Research Design

This study employed the descriptive-correlational method of research; descriptive since it examined the profile of parents and the pupils' attitude towards mathematics, and their level of performance in basic skills; correlational since it looked into the possible relationship between pupils and parent factor and pupil performance in mathematics problem-solving. According to Calmorin and Calmorin (2005), descriptive correlational method is appropriate to use if relationship between variables are to be measured.

Respondents of the Study

The respondents of the study consisted of the entire population of the Grades IV, V & VI SPED-FL classes enrolled during the SY 2011-2012 in Kiamba SPED Center, West Kiamba District, Sarangani Province, composed of 29 pupils, 34 pupils, and 32 pupils respectively. The total population was composed of 95 pupils.

The Research Instruments

Four instruments were used to collect data in this study: Basic Skills Tests; the Problem Solving Test; Mathematics Attitude Scale; and, Parental Involvement Questionnaire (PIQ). The Basic Skills Test and Mathematics Attitude Scale were designed to evaluate the profile of pupils in terms of mastery of basic skills and attitude towards mathematics; the PIQ was used to determine the profile of the pupils' parents in terms of parental involvement; and, the problem solving test assessed the level of the pupils' problem solving skills.

To measure the basic skills and problem solving skills of the pupils in mathematics, the Basic Skills Test and Problem Solving Tests for each grade level were developed by the researchers based on the required competencies prescribed by the Department of Education and with reference to the mathematics textbooks issued by the DepEd. Both tests included the comprehension of fundamental operations, i.e., addition, subtraction, multiplication, and division of whole numbers, fractions, and decimals, and percentage. Geometry, measurement and graph competencies were included in the Problem Solving tests. The number of items was based on the average length of the Division Mathematics Pretests & Post-tests and Diagnostics tests that were being administered. The Basic Skills Test and Problem solving test were multiple-choice objective tests with four options A, B, C, and D. Each item has one correct option (the key) and three distracters. The correct option attracts 1 mark and the total mark obtainable is 40.

The Mathematics Attitude Scale was adapted from Snow (2011). It was composed of 20 items and contained the most frequently-referenced math interest inventories identified that were deemed useful. It was designed to develop a math interest measure intended for elementary grade, theoretical in design, and showed evidence of psychometric properties for mathematics. All items therein evidenced adequate inter-correlations with the other items on the measure. An internal consistency analysis conducted for each factor (i.e., Emotion, Value, Knowledge, and Engagement) evidenced coefficients with acceptable ranges for a screening measure; an internal consistency reliability coefficient of .916 for the overall score. Identifying students that are interested in mathematics at a young age is crucial because early identification can foster interest and develop achievement in the future. According to Schunk et al (2008), interest is a motivational variable that is linked with educational attainment in that students are more likely to engage in an academic activity, pay more attention, and generate higher performance's if they are interested in the topic (Snow, 2011). A five-point scale was used. The mean score indicated the pupil's level of attitude towards the subject mathematics based on the following scale: 5 - Highly Positive (HP), 4 - Positive (P), 3 - Fair (F), 2 - Negative (N), and 1 - Highly Negative (HN).

The Parental Involvement Questionnaire was adapted from Cao et al (2006). It was called Perceived Parental Influence Scale (PPI). It was assumed that parental influences could be categorized into direct involvement and indirect involvement, and the instrument was designed to measure the pupils' perceptions of both. The dimensions of perceived direct parental involvement included mother's and father's assistance with homework and help with difficult mathematics problems. The dimensions of perceived indirect involvement investigated included mother's and father's attitude towards mathematics, encouragement, and expectations of pupil's achievement. The instrument was intended for elementary pupils and consisted of 16 items, eight measuring mother's influence on mathematics teaming as perceived by the pupils, and eight measuring father's influence. The five-point Likert scale was used. For each statement, pupils were asked to indicate whether they "Strongly Agree (SA)", "Agree (A)", "Disagree (D)", or "Strongly Disagree (SD)". The reliability analysis of the 16 items of the scale showed that the reliability coefficient (Cronbach Alpha) was 0.876 (Cao et al, 2006).

Statistical Tools

To enable the researcher to present and summarize the data in accordance with the objectives set in the study, the following statistical treatments were used.

The demographic profile of the pupil factors Attitude and Mastery of Basic Skills and the parent factor In terms of Parental Involvement were determined using the frequency, percentage distribution, mean, and weighted mean.

The pupils' mean score in the Mathematics Attitude Scale were described using the following description and scale: 5 - Highly Positive (HP), 4 - Positive (P), 3 - Fair (F), 2 - Negative (N), and 1 - Highly Negative (HN). Each positive item received a score based on points. A = 5, B = 4, C = 3, D = 2, and E = 1. The scoring for each negatively-phrased, i.e., items 4 and 11 was reversed, i.e., A = 1, B = 2, C = 3, D = 4, and F = 5.

The pupils' mean score in Basic Skills Test and Problem Solving Test were described using the National Achievement Test Result Scale. The following were its bracket and descriptions: 75 percent - up – Mastered, 50 percent - 74 percent – Nearly Mastered, and 0 - 49 percent – Not Mastered.

Analysis of the data on the Parental Involvement Questionnaire was done by calculating the mean score of each pupil on the PIQ. To achieve this, numerical scores were assigned to five response options given to each item on the Parental Involvement Questionnaire. The description and scale were: Strongly Agree = Highly Positive (HP) - 5; Agree = Positive - 4; Undecided = Fair - 3;

Disagree = Negative - 2; Strongly Disagree = Highly Negative - 1. The mean scores computed to determine the level of the pupils' parent involvement.

Chi-square test was used to determine the significant relationship between the pupils' problem solving skills and: 1) mastery of basic skills; 2) attitude towards mathematics; and, 3) parental involvement.

IV. PRESENTATION AND ANALYSIS OF DATA

Demographic Profile of Pupils in Terms of Basic Skills and Attitude Scale

Table 1 was designed to answer the question on the demographic profile of pupils in terms of basic skills. It showed that among the 95 pupils, 14 pupils or 15 percent of the pupil respondents had mean of 32.14 out of the 40 items given in the test answered correctly or got 80.36 percent correct responses. This group had Mastered the basic skills. This table also revealed that 46 pupils, which represent 48 percent of the total population, had Nearly Mastered the basic skills, obtaining a mean score of 23.80. This second group of pupils got 59.51 percent of the total items correctly. Thirty-five pupils or 37 percent of them have Not Mastered the basic skills. They correctly answered 37.85 percent, which means that 62.15 percent of the questions were incorrectly answered.

Table 1: Profile of Pupil Factors

Factors	No. of Pupils	% of pupils	Mean	Weighted Mean	%	Proficiency/ Attitude Level
Basic Skills						
Mastered	14	15	32.14	449.96	80.36	Mastered
Nearly Mastered	46	48	23.80	1094.80	59.51	Nearly Mastered
Not Mastered	35	37	15.14	529.9	37.85	Not Mastered
Total/ Average	95	100	23.70	21.84	**55%**	**Nearly Mastered**
Attitude						
Highly Positive	1	1.05	4.75	4.75	95.00	Highly Positive
Positive	26	27.37	3.75	97.5	75.00	Positive
Fair	58	61.05	3.04	176.32	60.80	Fair
Negative	10	10.53	2.11	21.1	42.20	Negative
Highly Negative	0	0	0	0	0	Highly Negative
Total/ Average*	95	100%	13.65	3.15	**63%**	**Fair**

The average weighted mean of the respondents in the basic skills test was 21.84 which is equivalent to 54.56 percent correct response. This means that the pupils need to master 45.44 percent more of the basic skills to achieve perfection in basic mathematics skills.

Analysis of the data on the number of pupils in the Mastered Level showed a decreasing mastery from Grade Four to Five and Six. Although the decreasing sequence in mastery of basic skills was not observed in the Nearly Mastered Level, the trend of decrease in mastery was again clear in the Not Mastered Level wherein there was an increase in number from 7 pupils in Grade Four, 11 in Grade Five, and 17 in Grade Six.

The decrease in number of pupils in the Mastered Level and the increase in number of pupils in the Not Mastered Level in basic skills implies that the pupils in Kiamba SPED Center failed to maintain the knowledge vital to the development of problem solving skills. This finding is supported by the work of Gallo & Johnson (2008) where in research pointed out that a substantial number of students lack the mastery of very elementary math concepts. Hence, they suggested that professors identify students with weak basic math skills early on so that some type of remediation can be done to bring these students up to par. This is in consonance

with Advanced Math Success (2008) that a solid knowledge of basic arithmetic skills is the foundation on which more complicated math is built. According to Silva, Tadeo & De Los Reyes, mastery of prerequisite skills spells success and ease with which the students can hurdle the mathematical theories and computations (Silva et al. 2006).

Table 1 also shows that the average weighted mean score of the pupils' attitude towards mathematics was 3.15 which is 63 percent - Fair. Only one pupil out of the 95 respondents (1.05 percent) had a Highly Positive attitude towards the subject mathematics; 26 pupils or 27.37 percent had Positive attitude; 58 pupils or 61.05 percent had a Fair attitude; 10 pupils or 10.53 percent had a Negative attitude; and. no pupil had a Highly negative attitude towards mathematics.

This is an indication that the majority of the pupil respondents only have an average attitude towards mathematics because the greatest percentage (61.05 percent) had a Fair attitude and almost none had extremely Negative or extremely Positive attitude. This is consistent with the findings of Mohd, Mahmod, & Mohd (2011) whose research findings revealed that the level of attitude (patience, confidence and willingness) towards problem solving is medium (average). The Fair level of attitude of pupils is related to the performance level of the pupils in problem solving which is also Fair. This concurs with the study of Nicolaidou & Philippou (2003), who explored the relationship between attitude towards mathematics, self-efficacy beliefs and problem solving and achievement of fifth-grade pupils, and found significant relationship between attitude and achievement.

Demographic Profile of the Parents in terms of Parental Involvement in the Pupils Learning

Table 2 shows the demographic profile of parents in terms of parental involvement. The level of involvement of the pupils' parents was 3.24, described as a Fair level of involvement of parents in the children's learning process. Positive level was reflected in the following questions on the questionnaire which asks if their mother is good in math; if their father is good in math; if the mother tells them that a person must do something carefully in order to do it well; if the mother tells them that a person must work hard in order to do something well. Item 16, wherein the father expects them to be the best pupil in math in their class was negative, which means that the father doesn't have too much expectation or doesn't demand too much from them in math.

Table 2: Demographic Profile of Parents in terms of Parental Involvement

Item No.	Number	Weighted Mean	Mean	Level Description
1	95	335.35	3.53	Positive
2	95	289.75	3.05	Fair
3	95	327.75	3.45	Fair
4	95	319.20	3.36	Fair
5	95	323.00	3.40	Fair
6	95	354.35	3.73	Positive
7	95	342.00	3.60	Positive
8	95	255.55	2.69	Fair
9	95	357.20	3.76	Positive
10	95	250.80	2.64	Fair
11	95	282.15	2.97	Fair
12	95	317.30	3.34	Fair
13	95	295.45	3.11	Fair
14	95	325.85	3.43	Fair
15	95	324.90	3.42	Fair
16	95	226.10	2.38	Fair
Total	1520	4926.70	3.24	**FAIR**

This implies that the mothers of the pupil respondents are more involved in the pupils' learning process. This finding is supported by Alvaera, Bayan, & Martinez (2009) of De LaSalle University, who found out that mother involvement was significantly

related with the students' academic achievement. Of all the predictors of achievement used by the researchers, it was only mother involvement that had significantly predicted student achievement.

The finding is an indication that the parents are moderately involved in the mathematics learning of their children. This level of involvement contributed to the Fair level of performance of the pupils in problem solving. This is supported by Henderson & Mapp (2002), who have linked parental involvement with student benefits of higher grades and test scores.

Level of the Pupils Problem Solving Skills

Table 3 shows that only 8 out of 95 pupils, which is 8.42 percent of the respondents have Mastered the problem solving skills. They had a mean score of 32.13 which means 80.32 percent of the problem solving test was correctly answered. Forty-six pupils, representing 48.42 percent of the population, Nearly Mastered the problem solving skills. They had a mean score of 23.20 which is equivalent to 58 percent correct response. The Not Mastered Level was composed of 41 pupils which is 43.16 percent of the respondents. They had a mean score of 14.56 which means 36.40 percent of their responses were correct. The average weighted mean Problem Solving Skills of the whole population studied was 20.22, which is 50.55 percent of the number of items answered. This falls under the Nearly Mastered Level. The SPED-FL Class needs mastery of at least 24.45 percent more to reach lowest mark (75 percent) in the Mastery Level as classified in National Achievement Test.

This implies that pupils of the SPED Center have a long way to go before an outstanding performance in problem solving could be achieved. This is supported by the Discussion Paper on the Enhanced K+12 Basic Education Curriculum (2010) stating that in the National Achievement Test (NAT) for Grade 6 in SY 2009-2010, the passing rate is only 69.21 percent. The NAT for high school is 46.38 percent in SY 2009-2010, a slight decrease from 47.40 percent in SY 2008-2009. The level of the Kiamba SPED Center pupils' problem solving skills is within the recorded range.

Table 3: Frequency, Mean and Percentage Distribution of Demographic Profile of Pupils in terms of the Problem Solving Skills Test by Mastery Level.

Mastery Level	No. of Pupils	% of Pupils	Mean Score	Weighted Mean	%	Proficiency Level
Mastered	8	8.42%	32.13	257	80.32	Mastered
Nearly Mastered	46	48.42%	23.20	1067	58	Nearly Mastered
Not Mastered	41	43.16%	14.56	597	36.4	Not Mastered
Average/Total	95	100%	23.29	20.22	50.55	**Nearly Mastered**

Relationship between the Pupils' Problem Solving Skills and the Pupil Factors

Table 4 shows that at 0.05 level of significance and 8 degrees of freedom, with chi-square tabular value of 15.51 while the Chi-square computed value is 52.39, Hypothesis 1 is rejected. Hence, there was a significant relationship between the pupil factor and problem solving skills when analyzed according to mastery of basic skills.

The findings imply that the Nearly Mastered level of Basic skills of the pupils contributed to the Nearly Mastered level of problem solving skills. This concurs with the study of Gallo & Johnson (2008) administered a test of basic math skills and concluded that students with strong elementary math skills perform significantly better in applied contexts.

Table 4: Computed and Tabular Chi-Square (X^2) Values Between Performance Level of Pupils in Problem Solving Test and the Pupil Factors

Pupil Factor	df	X^2 Computed	X^2 Tabular	Decision
Basic Skills	8	52.39	15.51	$H_0$1 Rejected
Attitude	16	62.59	26.30	$H_0$2 Rejected

Likewise, Table 4 presents that at 0.05 level of significance and degrees of freedom of 16, the chi-square tabular value is 26.30. The computed value is 62.59. The computed value is greater than the tabular value, therefore, $H_0$2 was rejected. There was a significant relationship between pupil factor and problem solving skills when analyzed according to attitude.

The findings indicate that the Fair attitude of the respondents had a significant relationship with the Nearly Mastered level of problem solving skills. This is supported by the study of Tella (2007) who investigated the impact of motivation on students' school

academic achievement in mathematics in secondary schools. The result indicates significant difference when extent of motivation was taken as variable of interest on academic achievement in mathematics based on the degree of their motivation.

Relationship between the Pupils' Problem Solving Skills and the Parent Factor

From Table 5, at 0.05 level of significance and degrees of freedom of 16, the Chi-square tabular value was 26.30. The computed value is 40.69. Therefore, there is a significant relationship between the parent factors and problem solving skills when analyzed according to Parental Involvement thus null hypothesis 3 is rejected.

The results indicate the significant relationship between the Fair level of Parental Involvement and the Nearly Mastered level of problem solving skills of the pupils. This is consistent with the findings of Cai (2003) who examined the relationship between parental involvement and students' mathematical problem-solving performance. The results of this study support the argument, is a statistically significant predictor of their children's mathematics achievement. Also, Deutscher & lbe's (2004) project examined the role that parent involvement has on 7^{th} through 11^{th} graders in a large rural area in Southern California and concluded that Parent involvement is important variable that positively influences children's education.

Table 5: Computed and Tabular Chi-Square (X^2) Values Between the Performance Level of Pupils in Problem Solving Test and the Parent Factors.

Parent Factor	df	X^2 Computed	X^2 Tabular	Decision
Parental Involvement	16	40.69	26.30	$H_0$3 Rejected

V. SUMMARY OF FINDINGS

The following are the findings based on the data gathered and presented in this study.

The overall mean score of the respondents in Basic Skills was 21.84 which classified as Nearly-Mastered Level and Proficiency of 55 percent. The Chi-square test disclosed a significant relationship between the pupils' mastery of basic skills and their problem solving skills. The null hypothesis is rejected; there is a significant relationship between the problem solving skills of pupils and mastery of mathematics basic skills.

The mean score of pupils' attitude was 3.15 which classified as Fair. The finding of the study showed that the attitude of pupils towards the subject mathematics had a significant relationship with their problem solving skills. This means that positive attitude will result in better problem solving skills.

$H_0$2, which states that there is no significant relationship between the problem solving skills and the attitude of pupils towards mathematics, was rejected. Positive attitude towards mathematics was necessary to increase the level of performance of the pupils in problem solving.

The finding shows that the level of parental involvement in the pupils' learning was Fair. Chi-square test disclosed that the problem solving skills of the pupils were not significantly affected by the parents factor when analyzed according to parental involvement; $H_0$3 was rejected.

VI. CONCLUSION

On the light of the findings established, the following are the conclusions formulated:

1. The proficiency level of the pupils in terms mastery of basic skills was on the Nearly-Mastered Level.
2. The attitude level of the pupils towards mathematics was Fair.
3. The parents' profile in terms or parental involvement was Fair.
4. The pupils' problem solving skills was on the Nearly-Mastered Level.
5. There was a significant relationship between the pupils' mastery of basic skills and their problem solving skills.
6. There was a significant relationship between the pupils' attitude towards mathematics and their problem solving skills.
7. There was a significant relationship between parental involvement and the pupils' problem solving skills.

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