IJAMS
INTERNATIONAL JOURNAL OF ADVANCED MULTIDISCIPLINARY STUDIES
Volume III, Issue 8 August 2023, eISSN: 2799-0664

Inclusive Mathematics Competencies Among Grade School Teachers And Pupil's Performance: Basis For Training Needs

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Abstract — Education is an essential building block for an individual in order to rise from the crucial stages of human development, it supplies not only the knowledge but also the in-service training needed to be exposed to those different fields. A person cannot just master or be an expert in his own craft without passing through the stages of education.
In the Philippine setting, the DepEd tribe is gearing our educational system to the present trend of globalization. Education is now designed to develop an individual who will not only be suitable but as well as flexible in the different functions of different orientations. To answer the call of suitability and flexibility, the K-12 was implemented beginning the school year 2012-2013.
The K-12 program is a flagship project of the Aquino administration where the government added two years plus kindergarten to our present ten-year basic education, hence the name of the program K-12. Filipinos have a deep regard for education. It has been strongly viewed as the pillar of national development and the primary avenue for social and economic stability and mobility. This is about putting our graduates on par with the rest of the world.
Teaching in Philippine elementary education means a teacher must be equipped with knowledge of different subjects in view of the fact that he will be teaching in all subject areas. The teacher in the Philippines, that is to say, must be a "Jack of All Trades". He can be a teacher in Science, Mathematics, English, and other subjects at every grade level. Unfortunately, elementary-grade teachers are struggling to master all subject areas. On the other hand, the achievements of pupils were evaluated and have been the subject of discussions among educators because of their low performance in recent years. The pupils' low performance in math is one of the hotly-talked-about topics. Various studies and research were conducted by many researchers but the problem still persists. This is perhaps due to the lack of specialization of teachers; their knowledge of math teaching and its content is limited only to what they experienced in pre-service education. Mathematics opens up the mind to logical reasoning, analytical thinking, and the ability for creative thinking,

Keywords — Mathematics Competencies, Performance, Training

I. Introduction

Education is an essential building block for an individual in order to rise from the special stages of human development… it supplies not only the knowledge but also the in-service training need to be exposed to those different fields. A person cannot just master or be an expert of his own craft without passing through the stages of education.

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Mathematics opens up the mind to logical reasoning, analytical thinking and the ability for creative thinking, deep focusing and clarity of thought and precision. It is the hub on which all scientific and technological studies find their bearings. Shapiro (2000) defines mathematics as the study of qualitative relations; put siply, it is the science of structure, order, numbers, space and relationships about counting, measuring and describing of shapes and objects. It qualifies in its own right as the science but it is often regarded as a language of and a link between all the sciences. (Soyemi. 1999)

Good teaching fundamentally helps the students acquire essential knowledge, skills, interests and attitudes in math. It is necessary in the realization of the practical or utilitarian value, disciplinary value and cultural value. Mathematics education trains students to make and use measurements including the study of computer programming, algebra, statistics, geometry and calculus.

As Hierbert and Carpenter (1992) asserted, one of the most widely accepted ideas in mathematical education is that student should understand mathematics. Pirie and Kieren (1994) mentioned the interest towards teaching and learning mathematics with understanding. According to Walther (1984), it is very ineffective to teach math in "recipes" where student just learn

processes without understanding the meaning behind them. It is important to understand concepts deeply because the best way to learn mathematics is to build off of previously learned concepts.

Mathematics instruction involves pedagogical strategies, curricular materials, and assessments that help all students master of the skills and concepts relevant to the development mathematical literacy. From the earliest grades and throughout their school experiences, children should feel the importance of success in solving problems, figuring things out, and making sense of mathematics. In fact, raising expectations for mathematical reasoning, communicating, making connections, using representations and problem solving has led to higher standards of performance in mathematics. This requires that students acquire and retain a broad range of mathematical skills and concepts and processes to learn the mathematics curriculum (Terry Anstrom). This require the competence of mathematics teacher.

According to Franz E. Weinert (2001), competency is a roughly specialized system of abilities, proficiencies, or skills that are necessary to reach a specific goal. This can apply to individual dispositions or to the distribution of such dispositions within a social group or an institution" Measuring quality teachers through performance on tests of basic verbal or mathematics ability may overlook key elements in what produces quality teaching. Effectiveness in teaching resides not simply in the knowledge a teacher holds personally but how this knowledge is used in classrooms.

Ross Turner describes a set of competencies that are fundamental to the development of "mathematical literacy", or a person's ability to apply their mathematical knowledge to practical situations. Sizer (1984) stressed that, a competent mathematics teacher will be a teacher with a good academic and pedagogical backgrounds, who is not easily worn out by the "system". To acquire competence, teachers should be given more training and knowledge on how to teach mathematics. Part of the solution is that the teacher should change their perception about their students. Students are no longer "container to be filled" instead they are curious people with much potential to learn anything new.

Poor performance in mathematics and other core content areas can be attributed in part to lack of students' interest in these subjects because the subjects are taught in a simonized disconnected fashion with the minimal time for true exploration and learning. Students need opportunities to wrestle with "big ideas" and apply what they have learned to the solution of interesting and compelling problems, particularly those facing society and requiring application of workplace skills (Greeno, 1997; Kazis, 2005).

The researcher is a teacher for several years, he observed that the popularity of math to the pupils is slipping as years gone by… Negative comments on the subject are often heard by a researcher from some pupils. Some math teachers in his district feels that math is a heavy weight to carry every day to make pupils appreciate the value of the subject. The researcher observed that the teachers teaches all subjects in his school and in fact this is a common practice in all schools

in the district. The researcher noted also that in the NAT pupils are still behind the desired target in most of the schools in the district in terms of math achievement. These observations made the researcher feel that maybe teachers in math lacks the competence to carry out effective math instruction in the classroom. To validate his observation, the study was undertaken.

Background of the Study

Piñan is one of the towns of Zamboanga del Norte. Piñan is inhabited by people from different races but originally it was the Subanen tribe that populated the area. Most of its native folks before practice the cultures and traditions of the Subanen. However, when people from different provinces as far as the Visayan provinces reach the place and started to make a living in the municipality thins have change and the land known as Piñan grow into a municipality known today as “The Haven of Zamboanga del Norte”.

The natives with the settlers started to engage in farming which became their common livelihood due to the fertility of the land, while others engage in business and in commerce.

There are several religious affiliations that rooted in town, from the Roman Catholic which has the biggest number of population, other groups such as Protestants (UCCP), Aglipay and other religious group exist in the municipality. The dialect which is widely spoken in the municipality is Cebuano. Other dialects such as Tagalog, Subanen, Boholanon, Ilocano/Hiligaynon and other dialects are also used by some people in town.

Piñan started as municipality part of Dipolog which is its mother city. It was established on August 22, 1951 and begun to exist as an independent municipality on December 8, 1951, that marks its inauguration which was held at exactly 2:35pm. Ever since the inhabitants of Piñan were engaged in farming, they cultivated their field by using “kaingin” system in which the land was cleared by setting fire to the woody plant and bushes, after which, holes were bored in the ground with a pointed sticks and the seeds were then planted.

They also used wood plows and harrows drawn by carabaos. Then, Piñan successfully became the source of farm production using their famous horse or cattle driven carretela, until most of the time, people from neighboring municipalities go to Piñan to purchase agricultural product, in which the, they established a so called “tabuan”.

In quest of improving the life conditions of the people, education in the area was introduced. Children were sent to school and continued until at present times. Establishment of elementary schools were done throughout the municipality. Today Piñan District has a total of 135 teaching and non-teaching personnel. It is headed and by a coordinating principal 2 (Principal in Charge of the District), with 3 principals 1 and 2 Head Teachers (HT-1 and HT-2), 14 Master Teachers, 4 of whom are Master Teacher 2 and 10 MT-1.

The practice of teachers teaching in all subjects in the district posed the problem of mastering the need competencies in math. The continued low achievement of the pupils in math which is below the mastery level, prodded the district supervisor and the school heads to encourage and motivate teachers to enhance the performance of the pupils. In-service trainings were undertaken in different aspects of teaching; many programs were done in the past but still the symptoms persist. The fading appeal of learning among pupils is also alarming. Teachers ask themselves, what needs to be done? I have done my best, but still my best was not good enough? Why? Due to the prevailing circumstances, the researcher hypothesizes that maybe teachers lack the necessary math competencies in their teaching. This is the rationale of the investigation, for the researcher believes that this is one of the hindrances of the pupils' academic performance in math.

Theoretical and Conceptual Framework of Study

The theory of the study is taken from the Boyatzis (1982) Concept of Competency. The concept of competency for the first time popularized by Boyatzis (1982), who defines competence as the ability to possess an attitude that looks at needs work; and the condition within the organization and delivering the desired outcomes.

Bartman et. Al. (2007) explained that, competency refers to knowledge, attitudes and skills that belong to someone for doing their jobs and solve problems efficiently and effectively.

mong the many various meanings ascribed to the notion of competence, expertise rather than the more widespread authorization has been chosen for this context. Translated into mathematical terms, this means that mathematical competence comprises having knowledge of, understanding, doing, using and having an opinion about mathematics and mathematical activity in a variety of contexts where mathematics plays or can play a role. This obviously implies the presence of a variety of factual and procedural knowledge and concrete skills within the mathematical field, but these prerequisites are not sufficient in themselves to account for mathematical competence. What then *a* mathematical competence? It is an independent, relatively distinct major constituents in mathematical competence as described above. One could also say that *a* mathematical competency is a well-informed readiness to act appropriately in situations involving a certain type of mathematical challenge (Niss & Hojgaard, 2011).

REVIEW OF RELATED LITERATURE AND STUDIES

Mathematics is the science that deals with the logic of shape, quantity and arrangement. Math is all around us, in everything we do. It is the building block for anything in our daily lives, including mobile devices, architecture (ancient and modern), art, money, engineering, and even sports.

Since the beginning of recorded history, mathematical discoveries has been at the front of every civilized society, and in use of even the most primitive cultures. The need for math arose

based on the wants of society. The more complex a society, the more complex the mathematical needs. Primitive tribes needed little more than the ability to count, but also relied on math to calculate the position of the sun and the physics of counting.

In mathematics, learning disability refers to unexpected learning problems after a classroom teacher or other trained professional (e.g., tutor) has provided the student with appropriate research-based mathematics interventions for a sustained period of time. Appropriate mathematics interventions refer to the use of validated instructional practices and the monitoring of response to the mathematics performance. Typically, students with a mathematics disability have difficulty making sufficient progress in mathematics compared to others in their peer group despite the implementation and documentation of validated teaching practices over time. (http://www.cldinternational.org/infosheets/mathdisabilities.asp)

Teacher ratings of student academic competence (teacher completed an academic Competence measure that assessed each child's motivation, reading and math competence, intellectual functioning, and overall academic competence) statistical analyses were used to determine the relationship between the percent of students with I EPs in the class and how much change occurred from year to year for students and classrooms on each of the measures. We found that:

- Report card grades, authentic student work, and standardized test scores were unaffected by the percentage of student with I Eps in class
- There was no evidence that teachers altered the rigor of their assignments in math or writing in classrooms that included students with disabilities
- Higher teacher ratings of student academic competence were associated with increased percentage of students with disabilities in the class
- As the percentage of students with iEPs in the class increased, we found a concomitant increase in both math report card grades, and the teacher ratings of student academic competence (Ron Korenich, et.al.).

A competent mathematics teacher will be a teacher with good academic and pedagogical backgrounds, who is not easily worn out by the "system" (Sizer, 1984). Based on this terse definition Farrell (1979 & 1984) derived the indicators of teacher competency in mathematics teaching and learning. The two types of competencies were identified by Farrell. The first type is characterized as mastery types, and the second type labelled developmental types.

Moreover, it was suggested that the first type of competency is a specific capability that secondary school mathematics teachers should certainly possess.

However, Farrell (1979) cautioned the over-use or abuse of the Mastery-type of teacher competency. She argued this class of competency should be merged with the developmental type. As an illusion, the following indicators of mathematics teacher competency provide base-line information for readers:

1. Teacher gives history, etymology of terms and symbols
2. Teacher explains why (e.g. graphing) techniques are being taught
3. Teacher correctly indicates the "why" of certain conventions in mathematics
4. Teacher uses counting and measuring examples before a new formula is developed and points out the usefulness of the formula. For more examples see Farrell (1979).

The four examples can be contrasted with the following two illustrations which is the distinction between mastery of competency and development type.

(1) The teacher is able to solve equations of the first and secondary degree. This pertains to the mastery type of teachers' competency.

(2) The teacher provides students with a rationale for the terms, definitions and algorithms of mathematics. This is an indicator of a developmental type of teacher competency. It combines the mastery of the subject matter of the discipline of mathematics with the pedagogical component of teacher education. Thus, it has an added advantage over the mastery type of competency. Also, the developmental competency calls for a balance between the subject-matter knowledge of mathematics and the pedagogical component of mathematics teacher education programme…(LEOU,1998)

Discussion of Mathematical Competencies

A person possessing competence within a field is someone able to master the essential aspects of that field effectively, incisively, and with an overview and certainty of judgement. Among the many various meanings ascribed to the notion of competence, expertise rather than the more widespread authorization has been chosen for this context. Translated into mathematical terms, this means that mathematical competence comprises having knowledge of, understanding, doing, using and having an opinion about mathematics and mathematical activity in a variety of contexts where mathematics plays or can play a role. This obviously implies the presence of a variety of factual and procedural knowledge and concrete skills within the mathematical field, but these prerequisites are not sufficient in themselves to account for mathematical competence.

What is the mathematical competence? It is an independent, relatively distinct major constituent in mathematical competence as described above. One could also say that a mathematical competency is a well-informed readiness to act appropriately in situations involving a certain type of mathematical challenge. The fact that such competencies are independent and relatively distinct does not imply that the different competencies are unrelated to each other or that they are so sharply defined that there is no overlap. Let us instead think of a competency as a "center of gravity" in a "cluster" of things that are dense near the middle and sparser towards the edges, and which is partly interwoven with other clusters.

In the characterizations of the individual competencies below, the word "ability" is sometimes used. IT must be pointed out that this is merely a linguistic substantiation of "being able to", and by no means a psychological term aimed at referring to a person's mental personality traits and general mental faculties.

Besides the competencies, themselves, three types of overviews and judgments pertaining to mathematics as a subject are also dealt with. As will become apparent, they are important for building up insight into the character of mathematics and its role in the world, and such insight does not automatically follow from mastery of the eight competencies.

Two groups of competencies

As intimated above, each of the competencies enables one, based on factual knowledge and concrete skills (which are not generally described in the actual characteristics of the competency) to carry out certain types of mathematical activities. The eight competencies have been divided into two groups, the first referring to the ability to ask and answer questions in and with mathematics and covering the first four competencies. The next with refers to the ability to deal with mathematical language and tools and covers the remaining four competencies.

Eight Competencies

1. TO ASK AND ANSWER IN, WITH, ABOUT MATHEMATICS
2. TO DEAL WITH MATHEMATICAL LANGUAGE AND TOOLSET
3. REASONING COMPETENCY
4. MODELLING COMPETENCY
5. PROBLEM TACKLING COMPETENCY
6. MATHEMATICAL THINKING COMPETENCY
7. REPRESENTING COMPETENCY
8. SYMBOL AND FORMALISM COMPETENCY

It is primarily on account of presentation considerations that we will operate with two groups of competencies here. From an overall point of view, the ability to cope with and in mathematics can be said to consist of exactly these two capacities or "super competencies", each of which, on closer examination, contains a set of specific competencies.

DEPARTMENT OF EDUCATION/OFFICE OF THE SECRETARY PRESS RELEASE

DepEd to enhance Math teachers' competencies

True to its commitment of giving teachers full support in delivering quality basic education the Department of Education has partnered with the Mathematics Trainers Guild (N/TG). The Philippines in the conduct of 2010 International Mathematics Educators Convention with special emphasis on Understanding by Design (UbD).

II. Methodology

This chapter presents the research method that was utilized in the study, the setting of the study, the respondents, sampling technique and procedure, the research instrument, the validity and reliability of the instrument, the data gathering procedure and the statistical continuum and tools for the analysis of data.

Research Method

The study used correlation method of research.

Setting of the Study

The study was conducted in the twenty-one (21) elementary schools of Piñan District, Zamboanga del Norte Division, Region IX, Zamboanga Peninsula.

Respondents of the Study

The respondents of the study were ninety-eight (98) teacher and ten (10) randomly selected pupils from each teacher of Piñan District, Zamboanga del Norte Division, Region IX, Zamboanga Peninsula.

Sampling Techniques and Procedure

The study employed purposive sampling for the teachers and random sampling for the students.

Research Instrument

The study used questionnaire for the math teachers' inclusive competencies in math. Part I of the questionnaire asked their profile and Part II of the questionnaire asked their competence

in the different math competencies outlined by Niss, 2003; Niss & Hojgaards Jensen, (2002)-Danish KOM Project and PELC Grade VI.

Validity and Reliability of the Instrument

The questionnaire was submitted to a panel of experts in education for its relevance to the study. The suggestions of the panel members were incorporated in the questionnaire, the authoritative validity and reliability was undertaken.

Data Gathering Procedure

The researcher asked the approval of the Division Superintendent of Zamboanga del Norte Division and the supervisor of Piñan District in order for the researcher to conduct the study.

Statistical Continuum and Treatment of the Data

After the data were collected and consolidated by the researcher, the researcher submitted the data to a statistician for analysis in descriptive and inferential aspects.

a. Statistical Continuum

Level of Math Teachers' Inclusive Competence

Scale	**Continuum**	**Qualitative Description**
5	4.20-5.00	Very Competent
4	3.40-4.19	Competent
3	2.60-3.39	Moderately Competent
2	1.80-2.59	Less Competent
1	1.00-1.79	Not Competent

Performance of Pupils' Math

Continuum	Qualitative Equivalent
95-above	Excellent
90-94	Very Satisfactorily
85-89	Satisfactorily
80-84	Moderately Satisfactorily
75-79	Fair
74-below	Poor

b. Statistical Formulae

The following formulae were used in the study

1. Simple percentage was used to illustrate the proportion.

   Percentage=(frequency/total) x 100%

2. $W_m = (\Sigma_i = 1 \ldots n\, w_i\ x_i/N)$ was the weighted mean formula, where w was the respective weight of each response, x was the number of respondents in that particular response, N was the number of samples and W was weighted mean of particular motivation.

3. Pearson chi-square was computed to find out the significant difference and relationship.

$X^2 = \Sigma_i = 1 \ldots n\ [(OC-EC)^2/E]$ was the Pearson chi-square test to find a significant difference for categorical data where OC was the observed count, EC was the expected count and X^2 was the Pearson chi-square

4. Contingency coefficient was calculated to find out the strength of association of categorical data.

$C= [x^2/(N+x^2)]^{1'2}$, where c was the contingency coefficient, N was the number of cases and x^2 was the Pearson Chi-Square.

III. Results and Discussion

This chapter presents the summary of findings, the conclusions derived, and the recommendations of the study.

The findings revealed the answers to the following questions:

1. What is the profile of grade school teachers in math?
2. What is the inclusive mathematics competence among grade school teachers?
3. What is the pupils' academic performance in math?
4. Is there a difference between the inclusive mathematics competences among grade school teachers when grouped according to their profile?
5. Is there a relationship between the inclusive mathematics competence among grade school teachers and the pupils' academic performance in math?

Summary of Findings

The following summary of finding was extracted from the result of the study:

1. The profile of grade school teachers in math in terms of:

1.1 Gender;

Seventeen (17) out of ninety-eight (98) or 17.3% of teachers were males and eighty-one (81) or 82.7% of teachers were females.

Most of grade school teachers in math were females.

1.2 Educational Attainment;

Twenty-nine (29) out of ninety-eight (98) or 29.6% of teachers were 4 years Education/education related; sixty-four (64) or 65.3% of teachers had MA units; four (4) or 4.1% of teachers were MA Holder and one (1) or 1.0% of teachers had Doctoral units.

Most of elementary grade teachers in math had MA units.

1.3 Length of service;

Thirty-one (31) out of ninety-eight (98) or 31.6% of teachers had a length of 10 years and below; forty-four (44) or 44.9%) of teachers were 11-20 years in service, nineteen (19) or 19.4% of teachers were of 21-30 years in service and four (4) or 4.1% of teachers had a length of 31 years and above.

Most of the grade school teachers in math had 11-20 years in service.

1.4 Number of units taken in math during pre-service education and

Thirty-nine (39) out of ninety-eight (98) or 39.8% of teachers had 9 units and below in math during pre-service education; forty (40) or 40.8% of teachers had 10-48 units; six (6) or 6.1% of teachers had 19-27 units; eleven (11) or 11.2% of teachers had 28-36 units and two (2) or 2.0% of teachers had 37 units and above.

Most of the grade school teachers in math had 10-18 units in math during pre-service education.

1.5 Number of trainings in math

Fifty-six (56) out of ninety-eight (98) or 57.1% of teachers had 5 trainings and below in math; thirty-six (36 or 36.7% of teachers had 6-10 trainings; four (4) or 4.1% of teachers had 11-15 trainings and two (2) or 2.0% of teachers had 16 trainings and above.

Most of grade school teachers in math had 5 trainings and below in math.

2. The inclusive mathematics competence among grade school teacher along:

2.1 Curriculum competency

All of the items were rated by the teachers as moderately competent. These were: item 1 (analyze existing mathematics curricula and syllabi, and to construct (elements of new ones) with a weighted mean of 3.29; item 2 (relate to existing mathematics curricula and syllabi, and to construct (elements of new ones) with a weighted mean of 3.34 and item 3 (implement existing mathematics curricula and syllabi, and to construct (elements of new one) with a weighted mean of 3.38.

The highest mean rated by the teachers was item 3 (implement existing mathematics curricula and syllabi, and to construct (elements of new ones) with a weighted mean of 3.38.

The lowest mean was item 1 (analyze existing mathematics curricula and syllabi, and to construct (elements of new ones) with a weighted mean of 3.29.

The grand mean of 3.34 showed that the teachers were moderately competent on curriculum competency.

2.2 Teaching competency

Four (4) of the items were rated by the teachers as competent. These were: item 1 (devise and plan mathematics teaching, including creating a rich spectrum of teaching/learning situations) with a weighted mean of 3.51; item 3 (find, judge, select, and create teaching materials) with a weighted mean of 3.59; item 4 (inspire and motivate students) with a weighted mean of 3.92 and item 5 (discuss curricula and justify teaching/learning activities with students) with a weighted mean of 3.67.

One (1) of the items was rated by the teachers as moderately competent. This was: item 2 (organize, orchestrate and carry out mathematics teaching, including creating a rich spectrum of teaching/learning situations) with a weighted mean of 3.37.

The highest mean rated by the teachers was item 4 (inspire and motivate students) with a weighted mean of 3.92

The lowest mean was item 2 (organize, orchestrate and carry out mathematics teaching, including creating a rich spectrum of teaching/learning situations) with a weighted mean of 3.37.

The grand mean of 3.61 showed that the teachers were competent on teaching competency.

2.3 Uncovering of learning competency

Three (3) of the items were rated by the teachers as competent. These were: item 1 (uncover, interpret and analyze students' learning of mathematics) with a weighted mean of 3.40; item 3 (uncover, interpret and analyze students' beliefs and attitudes towards mathematics) with a weighted mean of 3.40; and item 4 (identify development with the individual student) with a weighted mean of 3.56.

One (1) of the items was rated by teachers as moderately competent. This was: item 2 (uncover, interpret and analyze student's notions) with a weighted mean of 3.35.

The highest mean rated by the teachers was item 4 (identify development with the individual student) with a weighted mean of 3.56.

The lowest mean was item 2 (uncover, interpret and analyze students' notions) with weighted mean of 3.35.

The grand mean of 3.61 showed that the teachers were competent on uncovering of learning competency.

2.4 Assessment Competency

All of the items were rated by the teachers as competent. These were: item 1 (identify students' learning outcomes and competencies) with a weighted mean of 3.70; item 2 (assess students' learning outcomes and competencies) with a weighted mean of 3.72; item 3 (characterize and communicate students' learning outcomes and competencies) with a weighted mean of 3.56; item 4(selecting, modifying, constructing, critically analyzing, and implementing a varied set of assessment forms) with a weighted mean of 3.49 and item 5 19selecting, modifying, constructing, critically analyzing, and implementing instruments to serve different formative and summative purposes) with a weighted mean of 3.48.

The highest mean rated by the teachers was item 2 (assess students' learning outcomes and competencies) with a weighted mean of 3.72.

The lowest mean was item 5 (selecting, modifying, constructing, critically analyzing, and implementing instruments to serve different formative and summative purposes with a weighted mean of 3.48.

The grand mean of 3.59 showed that the teachers were competent on assessment competency.

2.5 Collaboration

All of the items were rated by the teachers as competent. These were: item 1 (collaborate with different sorts of colleagues within the discipline) with a weighted mean of 3.46; item 2 (collaborate with different sorts of colleagues outside the discipline) with a weighted mean of 3.41

and item 3 (collaborate with (parents, authorities) concerning mathematics teaching and its conditions) with a weighted mean of 3.47.

The highest mean rated by the teachers was item 3 (collaborate with (parents, authorities) concerning mathematics teaching and its condition) with a weighted mean of 3.47.

The lowest mean was item 2 (collaborate with different sorts of colleagues outside the discipline) with a weighted mean of 3.41.

The grand mean of 3.45 showed that the teachers were competent on collaboration competency.

2.6 Professional development competency

All of the items were rated by the teachers as competent. These were: item 1 (develop one's own competency as a mathematics teacher (meta-competency) with a weighted mean of 3.55; item 2 (participate in and relate to activities of professional development such as in-service courses, projects, conferences) with a weighted mean of 3.65; item 3 (reflect upon one's own teaching and needs for development) with a weighted mean of 3.64 and item 4 (keep oneself up-dated about new developments and trends in research and practice) with a weighted mean of 3.67.

The highest mean rated by the teachers was item 4 (keep oneself up-dated about new developments and trends in research and practice) with a weighted mean of 3.67.

The lowest mean was item 1 (develop one's own competency as a mathematics teacher (a meta-competency) with a weighted mean of 3.55.

The grand mean of 3.63 showed that the teachers were competent on professional development competency.

2.7 Learning Competency

2.7.1 Whole Number

All of the items were rated by the teachers as competent. These were: item 1 (order of operations on whole numbers) with a weighted mean of 3.97; item 2 (give the meaning of expression, equation, exponent, and base) with a weighted mean of 3.81; item 3 (evaluate an expression of involving exponents) with a weighted mean of 3.65; item 4 (evaluate an expression with two different operations with or without exponents and parenthesis/grouping symbols) with a weighted mean of 3.62; item 5 (evaluate an expression with more than 2 operations with or without exponents and parenthesis/grouping symbols) with a weighted mean of 3.64; item 6 (apply the order of operations in solving 2-3 step word problems) with a weighted mean of 3.80; item 7 (write an equation to solve multi-step word problems) with a weighted mean of 3.57; item 8 (solve

2-3 step word problems involving whole numbers) with a weighted mean of 3.72 and item 9 (describe answer in a complete sentence with proper units/labels) with a weighted mean of 3.55.

The highest mean rated by the teachers was item 1 (order of operations on whole numbers) with a weighted mean of 3.97.

The lowest mean was item 7 (write an equation to solve multi-step word problems) with a weighted mean of 3.57.

The grand mean of 3.73 showed that the teachers were competent along learning competency on knowledge of whole numbers.

2.7.2 Rational Numbers

Seventy-six (76) of the items were rated by the teachers as competent. These were item 1 (knowledge of decimal places) with a weighted mean of 3.88; item 2 (name a decimal for a given model (region/blocks, money, number line)) with a weighted mean of 3.80; item 3 (use different models to show a given decimal (region/block, money, number line)) with a weighted mean of 3.69; item 4 (rename fractions whose denominators are power of 10 in decimal form) with a weighted mean of 3.62; item 5 (read and write decimals) with a weighted mean of 3.94; item 6 (compare and order decimals) with a weighted mean of 3.84; item 7 (round decimals) with a weighted mean of 3.87; item 8 (estimate sums and differences of whole numbers and decimals) with a weighted mean of 3.77; item 9 (add and subtract whole numbers and decimals) with a weighted mean of 3.99; item 10 (add and subtract decimals without and with regrouping (with concrete/visual models)) with a weighted mean of 3.99; item 11 (add and subtract mixed decimals with regrouping) with a weighted mean of 3.79; item 12 (apply the different properties of addition to compute sums mentally) with a weighted mean of 3.85; item 13 (application of addition and subtraction of decimals) with a weighted mean of 3.94; item 14 (write an equation to solve word problems) with a weighted mean of 3.67; item 15 (solve word problems involving addition and subtraction of decimals including money sentence with proper labels/units) with a weighted mean of 3.84; item 16 (visualize multiplication and division using money as model) with a weighted mean of 3.86; item 17 (estimate products and quotient of whole numbers and decimals) with a weighted mean of 3.74; item 18 (multiply and divide rational numbers, (decimal and whole numbers)) with a weighted mean of 3.70; item 19 (multiply and divide mentally decimals by powers of 10) with a weighted mean of 3.52; item 20 (apply the properties of multiplication and division to compute products and quotients respectively with a weighted mean of 3.71; item 21 (apply multiplication and division of decimals in word problems) with a weighted mean of 3.65; item 22 (generalize when a number is divisible by another number divisibility rules) with a weighted mean of 3.48; item 23 (identify prime and composite numbers) with a weighted mean of 3.64; item 24 (enumerate factors and multiple given numbers) with a weighted mean of 3.61; item 25 (identify the prime factors of given numbers) with a weighted mean of 3.58; item 26 (write the prime factorization of a given number) with a weighted mean of 3.56; item 27 (determine the

greatest common factor (gcf) of 2 or more numbers) with a weighted mean of 3.64; item 28 (determine the least common multiple (lcm) of 2 or more numbers) with a weighted mean of 3.61; item 29 (write the factor described involving regions, sets and number line) with a weighted mean of 3.56; item 30 (rename fractions as decimals and vice versa) with a weighted mean of 3.68; item 31 (form equivalent fractions) with a weighted mean of 3.58; item 32 (solve for the missing terms in pair of equivalent fractions) with a weighted mean of 3.49; item 33 (reduce fractions to lowest terms) with a weighted mean of 3.83; item 34 (change mixed numbers to improper fractions and vice versa) with a weighted mean of 3.81; item 35 (estimate fraction close) with a weighted mean of 3.63; item 36 (find the least common denominator (lcd) of set of fraction) with a weighted mean of 3.80; item 37 (compare fractions and mixed forms using different methods (fraction sense, visual reasoning, renaming to like forms, cross products method, lcd method, order fractions in simple and mixed forms in ascending or descending order using different methods)) with a weighted mean of 3.57; item 38 (solve mentally word problems involving fractions) with a weighted mean of 3.48; item 39 (reduce answers to lowest term) with a weighted mean of 3.82; item 40 (represent addition and subtraction of fractions (using concrete and visual/pictorial models)) with a weighted mean of 3.64; item 41 (estimate sums and differences of fractions in simple and mixed forms) with a weighted mean of 3.52; item 42 (add or subtract similar fractions in simple or mixed forms without regrouping) with a weighted mean of 3.64; item 43 (add or subtract similar fractions in simple or mixed forms with regrouping) with a weighted mean of 3.62; item 44 (add or subtract dissimilar fractions in simple or mixed forms without regrouping) with weighted mean of 3.66; item 45 (add or subtract dissimilar fractions in simple or mixed forms with regrouping) with a weighted mean of 3.64; item 46 (add mentally similar and dissimilar fractions using the properties of addition) with a weighted mean of 3.55; item 47 (application of addition and subtraction of fractions) with a weighted mean of 3.71; item 48 (demonstrate to write an equation to solve word problems in addition and subtraction) with a weighted mean of 3.66; in item 49 (make drawings or diagrams to better understand the given problem with a weighted mean of 3.59; item 50 (solve word problems involving addition or subtraction of fractions in simple or mixed forms with or without regrouping) with a weighted mean of 3.52; item 51 (multiply and divide a fraction by another fraction (with visual models)) with a weighted mean of 3.53; item 52 (simplify factor by cancellation method before multiplying or dividing) with a weighted mean of 3.46; item 53 (multiply and divide fractions in simple and mixed forms) with a weighted mean of 3.57; item 54 (application of multiplication and division of fractions) with a weighted mean of 3.60; item 55 (write an equation for a word problem) with a weighted mean of 3.53; item 56 (make drawings/diagrams to better understand the given problem) with a weighted mean of 3.54; item 57 (solve word problems involving multiplication and division of numbers in mixed forms) with a weighted mean of 3.47; item 58 (forms ratio and proportion for groups of objects/numbers) with a weighted mean of 3.48; item 59 (use colon (:) and fractions in writing ratios and proportions) with a weighted mean of 3.48; item 60 (reduces a ratio to lowest terms) with a weighted mean of3.53; item 61 (find a missing term in a proportion) with a weighted mean of 3.49; item 62 (application of ratio and proportion) with a weighted mean of 3.54; item 63 (set up a proportion for a given

situation) with a weighted mean of 3.46; item 65 (gives the meaning of the elements used in solving percentage problems (percentage, ratio or percent, and base)) with a weighted mean of 3.42; item 66 (determine the percentage rate and base in a given problem) with a weighted mean of 3.40; item 67 (application of percent) with a weighted mean of 3.48; item 71 (find the rate or percent when the percentage or rate and base are given) with a weighted mean of 3.40; item 74 (solve word problems involving finding the percentage/rate/base) with a weighted mean of 3.70; item 75 (percent increase/decrease(discounts, original price, rate of discount, sale price and mark-up price)) with a weighted mean of 3.40; item 80 (use the correct operations with a weighted mean of 3.71 item 81 (analyze the word problem) with a weighted mean of 3.71; item 82 (show what is asked, what is/are given, the word clue/s, the operation to be used) with a weighted mean of 3.80; item 83 (e describe the answer in a complete sentence with proper labels/units) with a weighted mean of 3.77; item 84 (represent integers in their order on a number line) with a weighted mean of 3.52; item 85 (compares integers with a weighted mean of 3.47 and item 86 (order integers in increasing/decreasing order) with a weighted mean of 3.52.

Ten (10) of the items were rated by the teachers as moderately competent. These were: item 64 (solve word problems with: direct proportion; partitive proportion; inverse proportion) with a weighted mean of 3.35; item 68 (set up an equation or proportion to solve problems) with a weighted mean of 3.37; item 69 (solve the three types of percentage problems) with a weighted mean of 3.30; item 70 (find the percentage when the rate and base are given) with a weighted mean of 3.38; item 72 (find the base when the percentage or rate are given) with a weighted mean of 3.39; item 73 (compute common percentage mentally) with a weighted mean of 3.30; item 76 (commission (rate of commission, total sales, total income) with a weighted mean of 3.38; item 77 (rate of sales, tax, selling price, simple interest, principal rate and time) with a weighted mean of 3.31; item 78 (make simple predictions) with a weighted mean of 3.32 and item 10 (tell the number of favorable outcomes/chances) with a weighted mean of 3.29.

The highest mean rated by the teachers was item 10 (add and subtract decimals without and with regrouping (with concrete/visual models)) with a weighted mean of 3.99.

The lowest mean was item 10 (tell the number of favorable outcomes/chances) with a weighted mean of 3.29.

The grand mean of 3.60 showed that the teachers were competent along learning competency on knowledge rational numbers.

2.7.3 Geometry

All of the items were rated by the teachers as competent. These were: item 1 (draw different spatial figures) with a weighted mean of 3.41; item 2 (represent the different spatial figures, cube, rectangular prism, cylinder, sphere, pyramid, cone, etc.) with a weighted mean of 3.42 and item 3 (describes the different spatial figures) with a weighted mean of 3.50

The highest mean rated by the teachers was item 3 (describes the different spatial figures) with a weighted mean of 3.50.

The lowest mean was item 1 (draw different spatial figures) with a weighted mean of 3.41;

The grand mean of 3.44 showed that the teachers were competent along learning competency on knowledge of geometry.

2.7.4 Measurement

Three (3) of the items were rated by the teachers as competent. These were: item 1 (explain the surface area of solids) with a weighted mean of 3.40; item 2 (explain the surface area of solids) with a weighted mean of 3.40; item 2 (explain the unit of measure used for measuring the surface area of solids) with a weighted mean of 3.42 and item 8 (find the volume of a solid) with a weighted mean of 3.46.

Twelve (12) of the items were rated by the teachers as moderately competent. These were: item 3 (find the area formula of the following plane figures: parallelograms, triangles, trapezoids, and circles) with a weighted mean of 3.39; item 4 (derive a formula for finding the surface area of: cubes, prisms, cylinders) with a weighted mean of 3.30; item 5 (application of measurement of surface area) with a weighted mean of 3.31; item 6 (show how to write an equation or formula to solve for the surface area of solids) with a weighted mean of 3.28; item 7 (solve the word problems involving measurement of surface area) with a weighted mean of 3.37; item 9 (explain the unit measure used for measuring the volume solids, rectangular prisms) with a weighted mean of 3.38; item 10 (convert one cubic unit of measure to a larger or smaller unit) with a weighted mean of 3.33; item 11 (derive a formula for finding the volume of solids like: prism, cylinders, pyramid, and cones) with a weighted mean of 3.27; item 12 (application of measurement of volume) with a weighted mean of 3.35; item 13 (show how to write an equation or formula to solve for the volume of solid) with a weighted mean of 3.35; item 14 (solve word problems involving measurement of volume) with a weighted mean of 3.36 and item 15 (read and interpret readings from: (electric meter, water meter) with a weighted mean of 3.33

The highest mean rated by the teachers was item 8 (find the volume of a solid) with a weighted mean of 3.46.

The lowest mean was item 11 (derive a formula for finding the volume of solids like: prism, cylinders, pyramid and cones) with a weighted mean of 3.27.

The grand mean of 3.35 showed that the teachers were moderately competent along learning competency on knowledge of measurement.

2.7.5 Graphs

One (1) of the items was rated by the teachers as competent. These were: item 2 (construct a circle graph) with a weighted mean of 3.42.

Three (3) of the items were rated by the teachers as moderately competent. These were: item 1 (read and interpret data presented in a circle graph) with a weighted mean of 3.39; item 3 (organize data presented in a circle graph) with a weighted mean of 3.38 and item 4 (find the average of data presented in circle graph) with a weighted mean of 3.37.

The highest mean rated by the teachers was item 2 (construct a circle graph) with a weighted mean of 3.42

The lowest mean was item 4 (find the average of data presented in circle graph) with a weighted mean of 3.37.

The grand mean of 3.39 showed that the teachers were moderately competent along learning competency on knowledge of graphs.

Summary

The overall grand mean of 3.50 implied that the elementary Grade teachers were competent in math.

3. The pupil's academic performance in math

Eleven (11) out of nine hundred eighty (980) or 1.1% of pupils got 74-below or poor performance; one hundred ninety (190) or 20.3% of pupils got fair performance (75-79); fife hundred fifty-three (553) or 56.4% of pupils had moderately satisfactory performance (80-84); one hundred eighty-one (181) or 18.5% of pupils got satisfactory performance (85-89); thirty-six (36) or 3.7% pupils had very satisfactory performance (90-94).

The pupils had a moderately satisfactory performance in math.

IV. Conclusion

The following conclusions were derived from the finding of the study:

Generally, inclusive mathematics competencies among grade school teachers were positively associated with the academic performance of their pupils. This means that better competent teacher had pupils with better academic performance. The study also found that teachers need training in curriculum competency, and subject learning content area along Graphs and Measurements.

1. The grade school teachers were females, with MA units, 11-20 years in service, 10-18 units in math during pre-service education and had 5 trainings and below in math.

2. The grade school teachers were competent on Teaching Competency; Uncovering of learning competency; Assessment competency; Collaboration competency; Professional development competency and Learning Competencies (Whole Numbers, Rational numbers and Geometry) and they were moderately competent on Curriculum Competency, Learning Competencies in Graphs and Measurements.

3. The pupils had moderately satisfactory performance in math.

4. There was no significant difference between the inclusive mathematics competences among grade school teacher when grouped according to their profile. The null hypothesis is accepted.

There was a significant relationship between inclusive mathematics competence among grade teachers and the pupils' academic performance in math. The null hypothesis is rejected.om

V. Recommendations

The following recommendations are deemed appropriate by the researcher:

1. The grade school teachers of Piñan District must do readings in math curriculum competency

2. The grade school teachers must do research and study math topics that they feel they are less competent.

3. The grade school teachers must enhance their competencies in teaching and subject content by attending seminars and trainings.

4. The district supervisor must conduct training on curriculum competency, and subject content competencies along with interpreting and reading Graphs and Measurements.

REFERENCES

[1] LEOU, SHIAN (1998) Teaching Competencies Assessment Approaches for Mathematics Teachers. Department of Mathematics, National Kaohsiung Normal University, Proc. Natl. Sci. Counc. ROC(D), Vol. 8, No. 3, 1998 pp. 102-107
[2] Niss, 2003; Niss & Hojgaard Jensen, (2002). Danish KOM Project (KOM: Competencies and the Learning of Mathematics)

[3] Fajemidagba, Olubusuyi. MATHEMATICS TEACHER EDUCATION IN NIGERIA: ISSUES IN TEACHER COMPETENCIES. Department of Curriculum Studies & Educational Technology, University of Ilorin, Nigeria.
[4] Helena Roos Linnaeus University, Sweden
[5] http://edu.au.dk/fileadmin/edu/Forskning/Konferencer/Helena_Ross .pdf
[6] http://www.livescience.com/38936-mathematics.html
[7] http://www.cldinternational.org/infosheets/mathdisabilities.asp
[8] http://www.cimt.plymouth.ac.uk/journal/manullang.pdf
[9] http://www.uic-cfdc.org/pdf/InclusiveClassrooms_10.pdf
[10] http://research.acer.edu.au/cgi/viewcontent.cgi?article=1083&context=resdev

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