

Indicators Affecting the Learning of Fundamental and Basic Mathematics Among the First Year Elementary Education Students in Zambales

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Introduction

The world today is superior than ever before in vision and ideas. With the rapid growth of development of mathematics there has been a tremendous increase in the areas of application of the subject. Now, more than ever, as stated by Carl Friedrich Gauss, Mathematics is the queen of all sciences. It plays a very vital role in the development of science. The knowledge of this contributes largely to an effective, intelligent and enriched living. It is said to note however that while this subject matter is beneficial to everyone, only a few attended to its propagation.

Mathematics has been branded as a very difficult subject and only those gifted in the knowledge of it are those who can succeed in the fields where it is most needed (Alexander K. Dewdney, a Canadian Mathematicians). This has affected so many people, who, even without trying already have implanted in their minds that they cannot do anything as long as it is mathematics.

Along with it, the researchers find it essential to find out why some students have enough courage in Mathematics while still others are somehow not motivated or totally not interested in learning it.

The researcher believes that one of the most vital techniques in teaching is to know and understand the condition under which learning takes place. Thus, the study aims to find out the possible contributing indicators that affect the learning difficulty of the freshmen elementary teacher education students in Zambales.

In his five years in teaching BEED Mathematics, the researcher observed that there are difficulties in learning Mathematics mostly in the basic and fundamentals of mathematics, correlating to the result of 2012-2013 National Achievement Test in Fourth Year High School, wherein the Division of Zambales got the 51.8 MPS; the BEED freshmen students belong in this batch.

This research study is anchored on the concept that mathematics in the college particularly in College of Education cultivates linking and reasoning skills in order to strengthen their intellectual competence in mathematics not only as a course requirement but also as preparation for the future being a teacher, particularly a teacher of a basic learner, an Elementary teacher. This is in line with the aim of education, which is the total development of the individual as a person and as a member of the society, particularly in the teaching profession. The needed concept and skills are then developed, reinforced and broadened. Hence, there exists the necessity of making an intensive study of it, to know and to trace the common errors committed by the students and to provide them with necessity foundation in the future.

This research was designed to complement the professional education subject, mainly in the field of mathematics in teaching profession. It shall bring about the real life and vicarious experiences of a

teacher as a person, and of a prospective teacher with emphasis on the characteristics of a teacher as a person and as a professional. It shall provide a wide array of opportunities for reflection that would prepare one to become a good teacher.

This research is based on the idea that the elementary education students' perception is on basic learning, which relates to the ideas the student have, as well as their background of experiences after their performance in mathematics or any subject for that matter. These are the indicators that affect the performance of students in mathematics and it is the purpose of this study to find out what these indicators are.

In this study, the null hypotheses are:

1. There is no significant difference on the perceptions of the student-respondents toward the level of difficulty in the different areas of Mathematics when grouped according to profile variables.
2. There is no significant difference on the perceptions of the teacher-respondents toward the level of difficulty in the different areas of Mathematics when grouped according to profile variables.
3. There is no significant difference on teachers' responses on the indicators affecting the learning difficulty as cited in problem number eight (8) when grouped according to profile variables.
4. There is no significant relationship between the academic performance in Mathematics and the indicators towards difficulty in learning Mathematics.

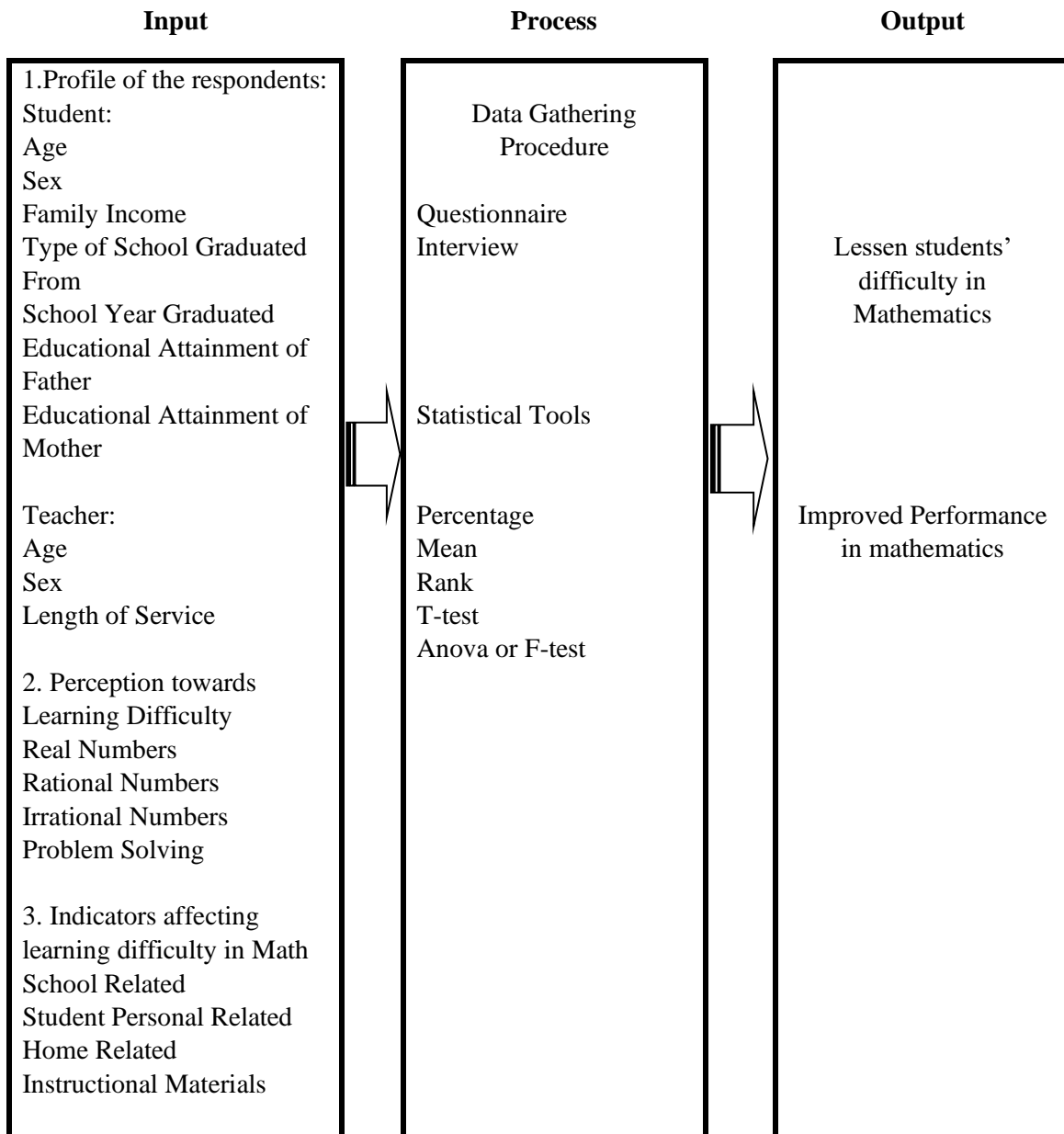


Figure 1. Conceptual Paradigm

The process dealt with the data gathering and processing methods used which were the questionnaire and unstructured interviews. Frequency counts, percentage, mean and rank distribution for descriptive statistics and Analysis of Variance or F-test and Pearson-r to establish differences and relationship were also conducted.

The output dealt with the final objective of lessening difficulty in mathematics and improving academic performance.

Methods

The descriptive method of research was used in this study since the aims of the study were to present facts about the prevailing situations and conditions revolving around the factors affecting the performance of the Zambales freshmen elementary education students on learning mathematics. According to Best (2000) descriptive research describes and interprets what the conditions and relationships that exist: practices that prevail; beliefs and processes that are going on; effects that are being felt, or trends that are developing. The process of descriptive research goes beyond gathering data. It involves an element of interpretation of meaning and significance of what is described. Thus, descriptive research is often combined with comparison and contrast involving measurements, classification, interpretation and evaluation.

Questionnaire was the main instrument used to gather the pertinent data for the study. The items in the questionnaire were based from the researcher's readings of related literatures and studies.

All data yielded by the instrument were tallied, tabulated, analyzed and interpreted accordingly.

To interpret the data effectively, the researcher employed the following statistical treatments:

1. Percentage
2. Weighted Mean
3. T- test
4. Pearson – Product Moment Correlation Coefficient (r)

Results/Findings

Profile of the Student-Respondents

The data show that majority came from public high schools and this is accounted on the program of the government "Education for All" which provides free elementary and high school education. A student is not charged a single centavo and the government has allocated funds for payment of salaries for teachers and other school personnel. The private schools usually charge tuition fees and other miscellaneous fees to defray expenses for electric bills, salaries of teachers and many others.

The data clearly show that majority of the student-respondents were recent high school graduates. It has been noted that immediately after graduation, only very few will pursue college education. Some were forced to work to help their family while some settle for marriage and raise their own family.

It reveals that most of the respondents' fathers only obtained high school undergraduate education. The predicament could be accounted on the poverty where parents are only farmers and fishermen and sending children to education indeed is a great sacrifice and difficulty for them.

The results also reveal that majority of the respondents' mothers obtained high school undergraduate education. This is due poverty where sending children to high school is indeed difficult especially because the family source of income is thru tricycle driving, doing carpentry, being laundry woman, managing small sari-sari store and being market vendors.

Profile of the Teacher- Respondents

It is reflected that most of the Mathematics instructors are new in the field with 1-4 years teaching experience and the rest are considered seasoned teachers as demonstrated by their competence and proficiency in teaching mathematics subject. The mean years of eight (8) shows loyalty and dedication to teaching profession. As they are about to stay for almost a decade in teaching, they are equipped with knowledge, skills and competence in delivering the services to the students.

Students' Academic Performance in Mathematics-1

The good academic performance is attributed on the perseverance and determination of the students to obtain a good academic performance as fulfillment of their promises made to their parents to excel in the school. According to some student-respondents, they are diligent in studying every principle to understand better the complex problems. They also claimed that some teachers use different strategies and motivational techniques to make the lesson presentation meaningful and worthwhile. Some teachers conducted remedial classes to ensure mastery of the subject matter.

Level of Difficulty in Different Areas of Mathematics as Perceived by the Student-Respondents

Real Numbers. The moderation of difficulty is accounted on the lack of drill and exercise in identifying the different properties of operations as multiplication, subtraction, division and addition of similar and dissimilar numbers. The teachers should be skillful enough in developing among the students the mastery of mathematical operations as requisites for higher mathematics.

Rational Numbers. It is gleaned from the results that students have less difficulty on the competence on applying the four operations for fractions and decimal numbers. Fractional mixed numbers are classified similar and dissimilar fractions which follow certain rules in converting to its lowest terms. The student-respondents were quite familiar on the basic rules as they understand this better during their high school education.

Irrational Numbers. The moderation of difficulty as perceived by the student-respondents could be accounted on the lack of competence in solving manually for they rely so much on the use of calculator. The use of calculator facilitates in the derivation of answers and solution at a lesser time and with accuracy.

Solving Problems. The student-respondents find moderation of difficulty in analyzing and making comprehension on worded problems. There are some problem sentences where terms and mathematical symbols are difficult to understand. They are skeptical in the derivation of the formula where mathematics notations and expressions are not clearly understood.

Level of Difficulty in Different Areas of Mathematics as Perceived by the Teacher-Respondents

Real Numbers. As per observation of the mathematics teachers, the result of quizzes and major examination reflects difficulty of the students in terms of application of concept properties of equality and congruency.

Rational Numbers. The moderation of difficulty is ascribed on the failure of the students in performing mathematical problems especially on fractions and decimals which involves ratio and proportions whose difficulty is manifested in the students' performance in the quizzes and periodic examinations.

Irrational Numbers. The difficulty is ascribed on the repetitive teaching, several exercises and remedial classes which manifest that the students show hard time in extracting root of a number without the use of calculator. The extraction root of a number requires mathematical ability with understanding on the principles of root extraction.

Solving Problems. The difficulties of the students are manifested in their low performance in quizzes and major examinations. This is a manifestation of the students' difficulty of transforming the worded problem in a workable formula or equation. The teachers observed difficulty in understanding and applying the signs and symbols as required in the worded problem.

Perception Towards Indicators Affecting the Learning Difficulties as Perceived by the Student-Respondents

School-related Indicators. The agreement is accounted on the satisfaction of the students on the good atmosphere in every classroom – well lighted, ventilated, and conducive to learning. The school provides opportunity for the students to enhance their mathematical capability through membership in organizations and societies relevant to mathematics.

The undecided responses are accounted on the objection of the respondents where some parents are supportive in their studies. There should be an application of the problem enabling the students to comprehend a concept. Parents should cooperate with the teachers by guiding their children with their home assignments (Garcia, 1999).

Indicators Affecting the Learning Difficulties as Perceived by the Teacher-Respondents

School-related Indicators. The agreement is accounted on the belief and trust of the respondents that the school plays a vital and imperative role in the learning development. Rooms should be conducive to learning equipped with lighting and ventilation, books and reference materials, and students' participation to school organization and extra and co-curricular activities.

Student personal-related Indicators. The agreement is accounted on the awareness and knowledge of the teachers on the principles of individual differences where no two individuals are alike and equal to each other. To some degree, there are many distinctions and differences. Not all people are mathematically inclined. One may be good in numbers but does not excel and is weak in intrapersonal and interpersonal intelligences.

Analysis of Variance to Test Significant Difference on The Perceptions of The Student-Respondents Towards the Level of Difficulty in The Different Areas of Mathematics When Grouped According to Profile Variable

Real Numbers. “The school graduated from” profile variable obtained an F- value of 0.002 which is lower than ($<$) F critical value of 3.867 at 0.05 alpha Level of Significance; therefore, the null hypothesis is accepted. Hence, there is no significant difference when grouped according to school graduated from profile variables.

The significant differences are accounted on the deviation and non-conformity on age, sex, family income, year graduated, educational attainment of father and educational attainment of mother profile variables towards difficulty in real numbers. This finding supports the study of Mendoza et.al, (2007) where it was clear that the students preferred classroom activities that must be in formal instruction which stressed active involvements and experiences. The students indicated that this is the indicator they liked the best about the mathematics classes. This finding suggests that the assessment of mathematics attitudes needs to differentiate enjoyment from usefulness and indicates the importance of the students’ investment through effort in developing positive attitude towards mathematics. It is encouraging to note the relative unimportance of rewards in the form of grades that students associated with liking mathematics.

Rational Numbers. The significant difference is accounted on the dissimilarity of opinion towards difficulty in rational numbers as to age, sex, year graduated, educational attainment of father and educational attainment mother profile variables. Many students do not learn things in the same manner or at the same speed, or at the same quality and completeness, which brings about many problems in mathematics instruction according to Capistrano (1988). However, Coloma (2001) contends that the development of the attitudes, interests and acts is carried on under conditions of voluntary participation without compulsion.

The Analysis of Variance to test significant difference on the perceptions of the teacher respondents towards the level of difficulty in real numbers when grouped according to profile variables was also conducted.

The “no significant” difference is accounted on the similarity and parallelism of observations of teachers among students’ difficulty in real numbers. According to the teachers, almost all students experience difficulty in identifying different properties of operations, performing different mathematical operation with four digits without using calculator and the ability of solving mathematical worded problems which involves series and variety of operations.

Rational Numbers. The Analysis of Variance to test significant difference on the perceptions of the teacher-respondents towards the level of difficulty in rational numbers when grouped according to profile variables was conducted.

This finding supports the study of Wolleat (1980) which stressed that it is indeed a truth that sex may be considered an indicator in determining the achievement of a student in mathematics. It was hypothesized that sex differences in attributions of performance in mathematics would parallel previously documented sex differences in attributions in other achievement areas. As predicted, males and females

differed in the strength of various attributions used to explain successful and unsuccessful performance in mathematics. Further, it was determined that sex and achievement in mathematics contribute separately to the variance in attribution patterns.

Irrational Numbers. The Analysis of Variance to test significant difference on the perceptions of the teacher-respondents towards the level of difficulty in irrational numbers when grouped according to profile variables was also conducted.

It is evident from the data that age, and length of service profile variables for teachers have effects towards difficulty in irrational numbers. The differences are accounted on the fact that the teachers older in age correspond the number of years in the service. The teachers who had served for more years developed competence and handle difficulty of the student to make learning more meaningful.

Solving Problem. The Analysis of Variance to test significant difference on the perceptions of the teacher respondents towards the level of difficulty in problem solving when grouped according to profile variables was also conducted.

This finding is similar to the study of Maya et. Al. (2007) who recommended that teachers should motivate their students by using games and plays in delivering lessons and problem solving. Also, they urge the administration of each school to make the classrooms more conducive to learning to make students feel more ready, relax and comfortable while studying. They also pointed out the school facilities such as libraries, clinics, Internet facilities and photocopying machines should be available to students.

Analysis of Variance to Test Significant Difference on The Perceptions of The Teacher-Respondents Towards the Indicators Affecting the Difficulty of Learning Mathematics-1 When Grouped According to Profile Variables

School-Related Indicators. The Analysis of Variance to test significant difference on the perceptions of the teacher-respondents towards school related indicators affecting the level of difficulty in Mathematics-1 when grouped according to profile variable was conducted.

This finding collaborates the study of Mendoza (2007) which stressed that it is important to consider that for a more effective and efficient teaching and learning mathematics, a thorough understanding of all the factors that affect learning and performance is imperative. A wide knowledge of a teacher in the school with regards to the background of learners is important in the objectives of the helping them develop their potentialities not only in mathematics, but in all open-learning experiences.

Student-related Indicators. The Analysis of Variance to test significant difference on the perceptions of the teacher respondents towards student related indicators affecting the level of difficulty in the different areas of Mathematics-1 when grouped according to profile variable was conducted.

These findings support the study of Abad (2000) who concluded that attitudes or interests, study habits of the student-respondents as well as the teachers' competency or teaching style significantly affect academic performance in the mathematics subject. Therefore, teachers' competencies should also be enhanced for these directly affect performances in the subject. Along with it, study habits of the students should be improved to produce good performance.

Instructional Materials. Oftentimes, the deterioration of the public school graduates is blamed on the teachers and instructional materials used. It is really the teachers that are the most important indicators in education of students as clarified by Cabarteja (2002).

Summary of Findings

Profile of the Student-Respondents

Age. Out of three hundred and sixty-eight (368) student-respondents, there were seventy-six (76) or 20.65% age 20 and above; ninety-nine (99) or 26.9% age 18-19; one hundred ninety-two (192) or 51.17% age 16-17; and one (1) or 0.27% age 15 below. The computed weighted mean age of the respondents was 17.78 years old.

Sex. Out of three hundred and sixty-eight (368) student-respondents, eighty-four (84) or 22.83% BEED freshmen students were male and two-hundred eighty-four (284) or equivalent to 77.17% were female.

Family Monthly Income. Out of three hundred and sixty-eight (368) student-respondents, there were seventeen (17) or equivalent to 4.62% with family monthly income ranges Php 20,001 and above; eighteen (18) or equivalent to 4.89% with Php 15,001 – Php 20,000; seventy-five (75) or equivalent to 20.34% with Php 10,001 – Php 15,000; seventy-two (72) or equivalent to 19.57% with Php 5,001 – Php 10,000; and one hundred eighty-six (186) or equivalent to 50.54% with Php 5,000 below. The computed weighted mean of income was Php 8, 322.28 monthly.

Type of high school graduated from. Out of three hundred and sixty-eight (368) student-respondents, one hundred ten (110) or equivalent to 29.89% graduated from private high schools while two hundred fifty-eight (258) or equivalent to 70.11% graduated from public high school.

School Year Graduated. Out of three hundred and sixty-eight (368) student-respondents, one hundred ninety (190) or equivalent to 51.62% graduated from high school during school year 2012-2013; seventy-eight (78) or equivalent to 21.20% graduated during the school year 2011-2012; twenty-seven (27) or equivalent to 7.34% graduated during the school year 2010-2011; seventy-three (73) or equivalent to 19.84% graduated during school year 2010 and below.

Highest Educational Attainment of Father. Out of three hundred and sixty eight (368) student-respondents, there were forty-three (43) or 11.68% whose fathers were elementary undergraduates; seventeen (17) or 4.62% whose fathers were elementary graduates; eighty-four (84) or 22.83% whose fathers were high school undergraduates; seventy-eight (78) or 21.2% whose fathers were high school graduates; sixty-five (65) or 75.66% whose fathers were college undergraduates; nineteen (19) or 5.16% whose fathers were technical –vocational graduate, and; sixty-two (62) or 16.84% whose fathers were college graduates.

Highest Educational Attainment of Mother. Out of three hundred and sixty-eight (368) student-respondents, there were thirty-nine (39) or 10.60% whose mothers were elementary undergraduates; twenty (20) or 5.43% whose mothers were elementary graduates; one-hundred thirty-six (136) or 36.96% whose mothers were high school undergraduates; seventy-two (72) or 19.57% whose mothers were high school graduates; fifty (50) or 13.58% whose mothers were college undergraduates;

ten (10) or 2.72% whose mothers were technical–vocational graduates; and forty-one or 11.14% whose mothers were college graduates.

Profile of the Teacher-Respondents

Sex. Out of seventeen (17) teacher-respondents, nine (9) or equivalent to 52.94% are males and eight (8) or 47.06% were female.

Age. Out of seventeen (17) teacher-respondents, (5) or 29.41% belong to age range of 45 and above; two (2) or 11.76% are 36 to 40 years old; seven (7) or 41.18% are 31 to 35 years old; and one (1) or 5.88% is 26 to 30 years old. The mean age of the teacher-respondents was 35 years old.

Major Field of Specialization. All seventeen (17) teacher-respondents are Mathematics majors.

Length of Years in Teaching Service. Out of seventeen (17) teacher-respondents, only one (1) or 5.88% has rendered teaching within 20 years and above and less than year respectively; three (3) or 17.65% have taught for 15 to 19 years; two (2) or 11.76% have taught for 10 to 14 years; three (3) or 17.65% have taught for 5 to 9 years; and seven (7) or 41.18% have taught for 1 to 4 years. The mean years of teaching service was 8.12 years.

Students' Academic Performance. Out of three hundred sixty-eight (368), there is only one (1) or equivalent to 0.27% who obtained 99-100 and 60-69 respectively; sixty-five (65) or equivalent to 17.66% got 90-98; one hundred ten (110) or equivalent to 29.89% got 86-89; eighty-one (81) or equivalent to 22.01% got 81-85; one hundred and five (105) or equivalent to 28.53% got 75-80; and five (5) or equivalent to 1.37% got 60-69. The computed weighted mean of the academic performance was 84.56 interpreted to be “good”.

Level of Difficulty in Different Areas of Mathematics as Perceived by the Student-Respondents

Real Numbers. The respondents perceived the following as “moderately difficult”: (1.1) identifying different properties of operations and (1.2) application of concepts properties of equality with weighted mean of 3.10, and 2.61 which ranked 1 and 2, respectively. They perceived the following to be “less difficult”: (1.3) Performing the different operations with 4 digits without calculator; and (1.4) solving mathematical statements involving series of operations as manifested by weighted mean of 2.59 and 2.20 which ranked 3 and 4, respectively. The computed overall weighted mean was 2.63 interpreted as “moderately difficult”.

Rational Numbers. The student-respondents perceived the following to be “less difficult”: (2.1) Illustrate fractions as part of a whole and (2.2.) Applying the four fundamental operations in fractions and decimals with weighted mean of 2.28 and 2.45 which ranked 4 and 3, respectively. They also perceived the following to be “moderately difficult”: (2.3) Transforming mixed numbers to fractional from, decimal, percent and vice versa; and (2.4) Solving problems involving ratio and proportion with weighted mean of 2.67 and 2.66 which ranked 1 and 2, respectively. The computed overall weighted mean was 2.51 interpreted as “less difficult”.

Irrational Numbers. The student-respondents perceived the following to be “moderately difficult”: (3.1) Extract the roots of a number without calculator; and (3.2.) Understand the concept of imaginary numbers with weighted mean of 2.90 and 2.83 which ranked 1 and 2, respectively. The computed overall weighted mean was 2.87 interpreted as “moderately difficult”.

Solving Problems. The student-respondents perceived the following to be “moderately difficult”: (4.1) Application and work with the specific formula; (4.2) Formulation and derivation of the needed equation; and (4.3) Worded problem comprehension, with weighted mean of 2.85, 3.18 and 3.35 which ranked 3, 2 and 1, respectively. The computed overall weighted mean was 3.13 interpreted as “moderately difficult”.

Level of Difficulty in Different Areas of Mathematics as Perceived by the Teacher-Respondents

Real Numbers. The teacher-respondents perceived the following to be “moderately difficult”: (1.2) Application of concept properties of equality with weighted mean 2.71 and which ranked 1st. They also perceived the following to be “less difficult”: (1.1) Identifying different properties of operations; (1.3) Performing the different operations with 4 digits without calculator; and (1.4) Solving mathematical statements involving series of operations with weighted mean of 1.88, 2.06 and 2.47 which was ranked 4, 3 and 2, respectively. The computed overall weighted mean was 3.04 interpreted as “moderately difficult”.

Rational Numbers. The teacher-respondents perceived the following to be “less difficult”: (2.2) Illustrate fractions as part of a whole with weighted mean of 2.41 and which ranked 4th. They also perceived the following to be “moderately difficult”: (2.2) Applying the four fundamental operations in fractions and decimals; (2.3) Transforming mixed numbers to fractional form, decimal, percent and vice versa; and (2.4) Solving problems involving ratio and proportion with weighted mean of 3.06, 2.65 and 2.88 which ranked 1, 3 and 2, respectively. The computed overall weighted mean was 2.75 interpreted as “moderately difficult”.

Irrational Numbers. The teacher-respondents perceived the following to be “difficult”: (3.1) Extract the roots of a number without calculator; and (3.2) Understand the concept of imaginary numbers with weighted mean of 3.53 and 3.41 which ranked 1, and 2, respectively. The computed overall weighted mean was 3.47 interpreted as “difficult”.

Solving Problems. The teacher-respondents perceived the following to be “moderately difficult”: (4.1) Application and work with the specific formula with weighted mean of 3.18 and which ranked 3rd. They also perceived the following to be “difficult”: (4.2) Formulation and derivation of the needed equation; and (4.3) Worded problem comprehension with weighted mean of 3.18 and 3.53 which ranked 2, and 1, respectively. The computed overall weighted mean was 3.49 interpreted as “difficult”.

Perception Towards Indicators Affecting the Learning Difficulties as Perceived by The Student-Respondents

School-related Indicators. The student-respondents “agree” on the following indicators: (1) “The school is conducive for learning” (4.01; rank 1st); (2) “Classrooms are well-lighted, properly

ventilated and free from external distractions” (3.57; rank 8th); (3) “ There are Mathematics classrooms to meet the needs of the student's populace” (3.51; rank 10th); (4) “Apparatuses and materials conform to the requirements of the Mathematics subject” (3.66; rank 3rd); (5) “There are enough Mathematics books, manuals, journals and other instructional materials” (3.57; rank 7th); (6) “The Mathematics instructor is efficiently discuss every subject matter (3.64; rank 5.5th); (7) “The Mathematics instructor is using a bilingual medium of instruction” (3.64; rank 5.5th); (8) “The examination is congruent to the Mathematics lesson and discussion” (3.56; rank 9th); (9) “There is a Mathematics syllabus for each student that serves as guide in instruction which meets acceptable institutional standards” (3.65; rank 4th); and (10) “The school has Mathematics organizations that help students in learning mathematics” (3.92; rank 2nd). The computed overall weighted mean was 3.67 interpreted as “agree”.

Student-personal Indicator. The student-respondents were “undecided” on the following” (1) “I am Mathematically incline” (2.72; rank 9th); (2) “I don't have interest whenever I encountered numbers and mathematical problems” (2.65; rank 10th); (3) “I am poor in memorizing and understanding key concepts in Basic Mathematics” (3.28; rank 8th); (5) “I set time schedule to study my lesson” (3.24; rank 5th). But they “agree” the following indicators: (4) “I am fond of reading Mathematics books” (3.49; rank 6th); (6) “I participate in the Mathematics discussion/activities” (3.74; rank 3rd); (7) “I make follow-up in every lessons which seems to be vague and obscure” (3.52; rank 5th); (8) “I attend my mathematics class every time” (4.12; rank 1st); (9) “I ask questions to the topics which I find difficult to understand” (3.71; rank 4th); and (10) “I listen attentively to my teacher's lecture and explanation” (4.08; rank 2nd). The computed overall weighted mean was 3.46 interpreted as “agree”.

Home-Related Indicator. The student-respondents “strongly agree” on the following indicator: (1) “My parents encourage schooling among children” (4.24; rank 1st). They “agree” the following indicators: (2) “Parents give time among children” (3.99; rank 2nd); (4) “I have so many responsibilities at home” (3.67; rank 3rd); and (6) “My parents help me to do my best to finish my projects” (3.46; rank 4th). But they were “undecided” on the following indicators: (3) “My parents give their hand when I have my assignment” (3.14; rank 7th); (7) “My parents go to school every time there' a meeting” (3.24; rank 6th); (8) “My parents are lax” (2.68; rank 8th); and (10) “My parents are strict” (3.27; rank 5th). Furthermore, they “disagree” on the following indicators: (5) “My parents are separated” (1.92; rank 10th) and (9) “My parents are frequently quarrelling” (2.52; rank 9th). The computed overall weighted mean was 3.21 interpreted as “undecided”.

Instructional Material-Related Indicator. The student-respondents “agree” on the following indicator: (1) “Real objects were used in teaching mathematics” (3.44; rank 2nd). They also “agree” on the following indicators: (2) “Visual aid are presentable and congruent to the lesson” (3.77; rank 2nd); and (10) “Materials are advance to the need of students “(3.42; rank 3rd). They were “undecided” on the following indicators: (3) “Projector, TV and video were used in particular lesson” (2.63; rank 10th); (4) “Seldom used of notebook “ (3.35; rank 5th); (5) “Explanations in the textbooks are not the same with teacher's explanation” (2.80; rank 8th); (6) “Difficult to understand the content of the book” (2.93; rank 6.5th); (8) “Too much materials was used in mathematics” (2.93; rank 6.5th); (7) “Instructional materials are congruent to the lesson” (3.67; rank 4th); and (9) “Materials are new in every lesson “ (2.78; rank 9th). The computed overall weighted mean was 3.17 interpreted as “undecided”.

Perception Towards Indicators Affecting the Learning Difficulties as Perceived by The Teacher-Respondents

School Related Indicator The teacher-respondents “agree” on the following indicators: (1) “The school is conducive for learning” (4.18; rank 2nd); (2) “Classrooms are well-lighted, properly ventilated and free from external distractions” (3.94; rank 3rd); (3) “There are Mathematics classrooms to meet the needs of the student's populace” (3.88; rank 4.5th); (4) “Apparatuses and materials conform to the requirements of the Mathematics subject ((3.88; rank 4.5th); (5) “There are enough Mathematics books, manuals, journals and other instructional materials” (3.76; rank 6th); (6) “The Mathematics instructor is efficiently discuss every subject matter” (3.71; rank 7.5th); (8) “The examination is congruent to the Mathematics lesson and discussion” (3.71; rank 7.5th); (7) “The Mathematics instructor is using a bilingual medium of instruction” (3.65; rank 9th). They were “undecided” on the following indicators: (9) “There is a Mathematics syllabus for each student that serves as guide in instruction which meets acceptable institutional standards” (3.12; rank 10th); and (10) “The school have a Mathematics organization that help students in learning mathematics” (4.59; rank 1st). The computed overall weighted mean 3.84 interpreted as “agree”.

Student Personal Related Indicator. The teacher-respondents “agree” on the following indicators: (1) “Students are Mathematically incline” (4.06; rank 1st); (2) “Students don't have interest whenever they encountered numbers and mathematical problems” (3.82; rank 2nd); (6) “Students participate in the Mathematics discussion/activities” (3.71; rank 4th); (8) “Students attend mathematics class every time“ (3.76; rank 3rd); and (10) “Students listen attentively in my lecture and explanation “ (3.53; rank 5th). They were “undecided” on the following indicators: (3) “Students are poor in memorizing and understanding key concepts in Basic Mathematics” (3.08; rank 8th); (4) “Students are fond of reading Mathematics books” (3.12; rank 7th); (5) “Students set time schedule to study their lesson” (2.88; rank 10th); (7) “Students make follow-up in every lessons which seems to vague and obscure” (3.29; rank 6th); and (9) “Students ask questions to the topics which I find difficult to understand” (3.00; rank 9th). The computed overall weighted mean 3.42 interpreted as “agree”.

Instructional Material Related Indicator. The teacher-respondents “agree” on the following indicators: (1) “Real objects were used in teaching mathematics ” (3.94; rank 2nd); (2) “Visual aids are presentable and congruent to the lesson” (4.06; rank 1st); and (7) “Instructional materials are congruent to the lesson” (3.82; rank 3rd). They were “undecided” on the following indicators: (3) “Projector, TV and video were used in particular lesson” (2.71; rank 10th); (4) “Seldom used of notebook” (2.88; rank 6th); (5) “Explanations in the textbooks are not the same with teacher's explanation” (2.76; rank 7th); (6) “Difficult to understand the content of the book” (2.65; rank 8.5th); (8) “Too much material was used in mathematics” (2.65; rank 8.5th); (9) “Materials are new in every lesson” (3.24; rank 5th); and (10) “Materials are advance to the need of students” (3.53; rank 4th). The computed overall weighted mean 3.22 interpreted as “undecided”.

Discussion

Test of Significant Difference on the Level of Difficulty as Perceived by Student-Respondents

Real Numbers. Analysis of Variance to test significant differences on the perceptions of the student-respondents towards the level of difficulty in real numbers when grouped according to profile variables was conducted. The age, sex, family income, year graduated, educational attainment of father and educational attainment mother profile variables obtained F-value of 17.94, 9.76, 3.88, 16.55, 11.22 and 16.19, respectively, which are greater than ($>$) the F-critical values of 2.63, 3.87, 2.40, 2.63, 2.12 and 2.12, respectively, at 0.05 Alpha Level of Significance; therefore, the null hypothesis is rejected. This shows that there is significant difference when grouped according to age, sex, family income, year graduated, educational attainment of father and educational attainment of mother profile variables. On the other hand, the “school graduated from” profile variable obtained F- value of 0.002 which is lower than ($<$) F critical value of 3.867 at 0.05 alpha Level of Significance; therefore, the null hypothesis is accepted. This reveals that there is no significant difference when grouped according to “school graduated from” profile variable.

Rational Numbers. Analysis of Variance to test significant differences on the perceptions of the student-respondents towards the level of difficulty in rational numbers when grouped according to profile variables was conducted. The age, sex, year graduated, educational attainment of father and educational attainment mother profile variables obtained F-values of 7.84, 5.11, 7.94, 46, 5.17 and 6.75, respectively, which are greater than ($>$) the F-critical values of 2.63, 3.87, 2.63, 2.12 and 2.12, respectively, at 0.05 alpha Level of Significance. Therefore, the null hypothesis is rejected. This reveals that there is significant difference when grouped according to age, sex, year graduated, educational attainment of father and educational attainment mother profile variables. On the other hand, family income and school graduated from profile variables obtained F-values of 2.22 and 0.54, respectively, which are lower than ($<$) F-critical values of 2.40 and 3.86, respectively. Therefore, the null hypothesis is accepted. This reveals that there is no significant difference when grouped according to family income and school graduated from profile variables.

Irrational Numbers. Analysis of Variance to test significant differences on the perceptions of the student-respondents towards the level of difficulty in irrational numbers when grouped according to profile variables was conducted. The age, sex, family income, year graduated, educational attainment of father and educational attainment mother profile variables obtained F-values of 7.98, 5.19, 2.25, 7.59, 5.25 and 6.87, respectively, which are greater than ($>$) the F-critical values of 2.63, 3.87, 2.40, 2.63, 2.12 and 2.12, respectively, at 0.05 alpha Level of Significance. Therefore, the null hypothesis is rejected. This reveals that there is significant difference when grouped according to age, sex, family income, year graduated, educational attainment of father and educational attainment mother profile variables. On the other hand, “school graduated from” profile variable obtained F-values of 0.53 which is lower than ($<$) F-critical values of 3.867. Therefore, the null hypothesis is accepted. This shows that there is no significant difference when grouped according to “school graduated from” profile variable.

Problem Solving. Analysis of Variance to test significant differences on the perceptions of the student-respondents towards the level of difficulty in problem solving when grouped according to profile variables was conducted. The age, sex, family income, year graduated, educational attainment of father and educational attainment mother profile variables obtained F-values of 10.76, 6.60, 2.72, 10.13, 6.92 and 9.34, respectively which are greater than ($>$) the F-critical values of 2.63, 3.87, 2.40, 2.63, 2.12 and 2.12, respectively, at 0.05 alpha Level of Significance. Therefore, the null hypothesis is rejected. This shows that there is significant difference when grouped according to age, sex, family income, year

graduated, educational attainment of father and educational attainment mother profile variables. On the other hand, “school graduated from” profile variable obtained F-values of 0.37 which is lower than ($<$) F-critical values of 3.867. Therefore, the null hypothesis is accepted. This reveals that there is no significant difference when grouped according to school graduated from profile variable.

Test of Significant Difference on the Level of Difficulty as Perceived by Teacher-Respondents

Real Numbers. Analysis of Variance to test significant difference on the perceptions of the teacher-respondents towards the level of difficulty in real numbers when grouped according to profile variables was conducted. The age, sex and length of service profile variables obtained F values of 0.11, 0.0044 and 0.18, respectively, which are lower than ($<$) the F critical values of 3.26, 4.54 and 3.44, respectively at 0.05 Alpha Level of Significance. Therefore, the null hypothesis is accepted. This shows that there is no significant difference on the perception towards level of difficulty in real numbers when grouped according to age, sex, and length of service profile variables.

Rational Numbers. Analysis of Variance to test significant difference on the perceptions of the teacher-respondents towards the level of difficulty in rational numbers when grouped according to profile variables was conducted. The age, and sex profile variables obtained F values of 7.15 and 15.30, respectively, which are higher than ($>$) the F critical values of 3.26, and 4.54, respectively, at 0.05 Alpha Level of Significance. Therefore, the null hypothesis is rejected. This shows that there is significant difference on the perception towards level of difficulty in rational numbers when grouped according to age, and sex profile variables. On the other hand, length of service profile obtained F value of 1.73 which is lower than ($<$) the F critical values of 3.44 at 0.05 Alpha Level of Significance. Therefore, the null hypothesis is accepted. This shows that there is no significant difference on the perception towards level of difficulty in rational numbers when grouped according to length of service profile variable.

Irrational Numbers. Analysis of Variance to test significant difference on the perceptions of the teacher-respondents towards the level of difficulty in irrational numbers when grouped according to profile variables was conducted. The age, and length of service profile variables obtained F values of 3.48 and 76.19, respectively, which are higher than ($>$) the F critical values of 3.26, and 3.44, respectively, at 0.05 Alpha Level of Significance. Therefore, the null hypothesis is rejected. This reveals that there is significant difference on the perception towards level of difficulty in irrational numbers when grouped according to age, and length of service profile variables. On the other hand, sex profile obtained F value of 2.79 which is lower than ($<$) the F critical values of 4.54 at 0.05 Alpha Level of Significance. Therefore, the null hypothesis is accepted. This shows that there is no significant difference on the perception towards level of difficulty in rational numbers when grouped according to sex profile variable.

Problem Solving. Analysis of Variance to test significant difference on the perceptions of the teacher-respondents towards the level of difficulty in problem solving when grouped according to profile variables was conducted. The age, and sex profile variables obtained F values of 9.54 and 4.95, respectively, which are higher than ($>$) the F critical values of 3.26, and 4.54, respectively, at 0.05 Alpha Level of Significance. Therefore, the null hypothesis is rejected. This reveals that there is significant difference on the perception towards level of difficulty in solving problems when grouped according to age, and sex profile variables. On the other hand, length of service profile obtained F value of 2.58 which is lower than ($<$) the F critical values of 3.44 at 0.05 Alpha Level of Significance. Therefore, the null

hypothesis is accepted. This shows that there is no significant difference on the perception towards level of difficulty in rational numbers when grouped according to length of service profile variable.

Test of Significant Difference on the Indicators Affecting Level of Difficulty as Perceived by Teacher -Respondents

School Related Indicator. Analysis of Variance to test significant difference on the perceptions of the teacher-respondents towards school related indicators affecting the level of difficulty in Mathematics-1 when grouped according to profile variable was conducted. The age, sex, and length of service profile variables obtained F –values of 1.19, 0.05 and 1.62, respectively which are lower than (<) the F critical values of 3.18, 4.54 and 3.20, respectively, at 0.05 alpha Level of Significance. Therefore, the null hypothesis is accepted. This shows that there is no significant difference on the perception towards school related indicators when grouped according to age, sex, and length of service profile variables.

Student-Related Indicator. Analysis of Variance to test significant difference on the perceptions of the teacher-respondents towards student related indicators affecting the level of difficulty in the different areas of Mathematics-1 when grouped according to profile variable was conducted. The age profile variable obtained F –value of 3.6 which is higher than (>) the F critical value of 3.18 at 0.05 Alpha Level of Significance. Therefore, the null hypothesis is rejected. This shows that there is significant difference on the perception towards school related indicators when grouped according to age. On the other hand, sex and length of service profile variables obtained F values of 3.00 and 0.56, respectively, which are lower than (<) F critical values of 4.54 and 3.0, respectively. Therefore, the null hypothesis is accepted. This shows that there is no significant difference on the perception towards student-related indicators when grouped according to sex and length of service profile variables.

Instructional Material Indicator. Analysis of Variance to test significant difference on the perceptions of the teacher-respondents towards instructional material related indicators affecting the level of difficulty in the different areas of Mathematics-1 when grouped according to profile variable was conducted. The age, sex and length of service profile variables obtained F–values of 0.54, 0.43, and 0.27, respectively, which are lower than (<) the F critical values of 3.18, 4.54 and 3.20, respectively, at 0.05 Alpha Level of Significance. Therefore, the null hypothesis is accepted. This shows that there is no significant difference on the perception towards instructional material related indicators when grouped according to age, sex, and length of service profile variables.

Test of Relationship between academic performance and the level of difficulty. The Pearson Product Moment coefficient correlation or (r) was conducted to test whether significant relationship exists between the academic performance and the level of difficulty. The computed (r) is equal to 0.18 which denotes very low positive correlation. This signifies that the perceived difficulty in real numbers, rational numbers, irrational numbers and problems solving has low effect in their academic performance.

Conclusions

Based on the summary of the investigations, the researcher concluded that:

1. The student-respondent is a typical female in her teenage hood, whose father and mother are high school undergraduate, a graduate in public school and with meager family income.
2. The teacher-respondent is a typical female in her early adulthood and has served an adequate number of years in teaching.
3. The student obtained “good” academic performance in Mathematics.
4. The student’s perceived level of difficulty is “moderately difficult” in real number, irrational number and solving problems while “less difficult” on rational numbers.
5. The teacher-respondents’ perceived level of difficulty is “moderately difficult” on real numbers and rational numbers while “difficult” on irrational numbers and solving problems.
6. The student-respondents “agree” on school and student-related indicators while are “undecided” on home related and instructional materials affecting level of difficulty.
7. The teacher-respondents “agree” on school related and student-related while are “undecided” on instructional material affecting level of difficulty.
8. The student-respondent perceived the following: age, sex, family monthly income, year graduated and educational attainment of father and mother to be “significant” in learning in real numbers; age, sex, year graduated, and highest educational attainment of father and mother to be “significant” in learning rational numbers; age, sex, family income, school graduated from, year graduated and highest educational attainment of father and mother to be “significant” in learning irrational numbers; and age, sex, family income, year graduated highest educational attainment of father and mother to be “significant” in problem solving.
9. The teacher-respondent perceived age and sex on rational to be “significant” in solving problems; age and length of service to be “significant” in learning irrational numbers; and no profile variables to be “significant” in learning real numbers.
10. The teacher-respondent perceived “significant” to age on student-related indicators respectively while “not significant” on all profiles towards school-related and instructional materials indicators.
11. There is a very low positive correlation between academic performance and the level of difficulty.

Recommendations

Based on the summary of findings and conclusions, the researcher offers the following recommendations:

1. Teachers should attend seminar and workshop in order to develop competence in test construction and table of specification.
2. With institution having many students, the administration should construct additional classrooms equipped with proper lighting and ventilation.
3. Encourage teachers on the use of computer technology through power point presentation in lesson presentation and activities.
4. Develop a simplified and easy-to-understand instructional materials like modules or worksheets in Mathematics.

5. Conduct remedial classes and tutorial particularly to those students who consider mathematics as their “waterloo”.
6. Coordinate with church leaders and officials to emphasize the importance of family and counsel the family couple to avoid quarrelling and separation which severely affects the education of the children.
7. Conduct a parallel study with an in-depth and wider scope to validate the findings obtained in the study.

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