OPERATIONAL EFFICIENCY OF K TO 12 SPIRAL APPROACH IN MATHEMATICS

A Thesis

Presented to

The Faculty of College of Graduate Studies

Samar State University

Catbalogan City, Samar

In Partial Fulfillment

of the Requirements for the Degree

Master of Arts in Teaching (MAT)

Major in Mathematics

MA. EMALYN A. UY

March, 2018

APPROVAL SHEET

This thesis entitled "**OPERATIONAL EFFICIENCY OF K TO 12 SPIRAL APPROACH IN MATHEMATICS,**" has been prepared and submitted by **MA. EMALYN A. UY**, who having passed the comprehensive examination, is hereby recommended for oral examination.

JONAH GAY V. PEDRAZA, MAT
College of Education Faculty, SSU
Adviser

Approved by the Committee on Oral Examination on **March 2, 2018** with a rating of **Passed**.

FELISA E. GOMBA, Ph.D.
Vice President for Academic Affairs/
Acting Dean, College of Graduate Studies, SSU
Chairman

RONALD L. ORALE, Ph.D.
Vice President for Planning, Research and Extension Services, SSU
Member

GINA U. ESPAÑO, Ph.D.
Dean, College of Education, SSU
Member

FLORABELLE B. PATOSA, Ph.D.
Dean, College of Arts and Sciences, SSU
Member

Accepted and approved in partial fulfillment of the requirements for the Degree, **Master of Arts in Teaching major in Mathematics.**

March 2, 2018
Date of Final Defense

FELISA E. GOMBA, Ph.D.
Vice President for Academic Affairs/
Acting Dean, College of Graduate Studies, SSU

ACKNOWLEDGEMENT

The making of this thesis was indeed a tough yet very fulfilling when it was done because of the assistance and compassion of the following people.

To **ma'am Jonah Gay V. Pedraza**, faculty member of the College of Education, for her untiring support, motivation and careful attention in detail with my research.

To the panel committee both in pre-oral and final defense: **Dr.Felisa E. Gomba,** Vice President for Academic Affairs/Acting Dean of College of Graduate Studies, for her insightful comments and constructive suggestions during the deliberation process; **Dr. Ronald L. Orale**, Vice President for Planning, Research and Extension, who serve as my consultant prior to the making of this research, for sharing his spontaneous knowledge and guidance which motivates the researcher to pursue this study into thesis writing; **Dr. Florabelle B. Patosa**, Dean of the College of Arts and Sciences, for imparting her expertise in guiding the researcher in using appropriate statistical tools for the study; and to **Dr. Gina U. Español**, Dean of the College of Education, for the assistance and direction as well as encouraging the researcher to be positive and not to lose hope in finishing this study.

To **ma'am Emma Q. Tenedero**, faculty member of the College of Arts and Sciences, for the assistance and mentoring the researcher in the statistical computation and interpretation of data in this study.

To all the **Grade 6 and Grade 10 students** and the **Mathematics teachers** as well of Lawaan ES, Lawaan NHS, Casandig ES, Casandig NHS, Tenani IS, Wright I CES, and Wright NHS, for the cooperation in completing the data needed for this study.

To the researcher's **family, friends and co-teachers** for cheering me up in this hardship and unending support, love and understanding during the completion of this research.

Above all, to our **Almighty God**, for giving the researcher the strength and energy in overcoming all those sleepless nights and letting me through all the difficulties encountered in this battle.

The Researcher

DEDICATION

To **God**, for giving good health from the start until my last struggle…

To my **family**, for being always there in my worst and best time…

To my mentors, for imparting their expertise and compassion towards teaching…

To **mystudents**, my great source of inspiration…

To **my friends**, for their untiring love and support…

To all of you, the researcher humbly dedicates this academic masterpiece.

-Malyn-

ABSTRACT

This study determined the operational efficiency of K to 12 spiral approach in Mathematics among Grade 6 & Grade 10 students in the seven selected elementary and secondary schools of Samar Division, particularly located in Paranas, Samar for the school year 2017-2018. This study utilized descriptive research design with comparative analyses assessing the efficiency implementation of K to 12 spiral approach in Mathematics curriculum as perceived by the 6th and 10th grade students including their Mathematics teacher. For the finding of the study, the targeting standards of the curriculum as one of teacher's perspective on the implementation of the K to 12 spiral mathematics was also revealed. Teachers are not prepared to help students meet those standards since they were also confused with the new spiral approach used in teaching K to 12 Mathematics. According to almost 34 teachers as long as they follow the underlying principles in teaching and continue to do their task as a teacher, K to 12 curriculum will be worked out effectively. For the conclusion, students who were exposed too much time in instruction significantly gain high achievement results compared to others who experienced fewer exposure of the concepts or discussion in the implementation of the new curriculum. Time allotment for the discussion of all the competencies in the curriculum is not enough to be covered for the entire year and teachers were conducting remediation to resolve the policy on promoting and retaining a student. A strong parent-teacher partnership helps students to practice a good study habit which help students to engage actively in developing their potentials during Math classes.

TABLE OF CONTENTS

Chapter 1

THE PROBLEM AND ITS SETTING

Introduction

The K to 12 Basic Education Program is the flagship program of the Department of Education in its desire to offer a curriculum which is attuned to the 21st century. It has been looked upon as the better way to improve the efficiency and competency of every Filipino graduates.

Now on its sixth year of implementation, though the government faces many problems as it implements the program, yet, the Department of Education (DepEd) is still implementing K to 12 as it is mandated by RA 10533 or the Enhanced Education Act of 2013 aiming for decongesting and enhancing the basic education system of the Philippines by strengthening its curriculum and lengthening the number of years of basic education from ten to twelve years (SEAMEO-INNOTECH, 2012:7-8).

Education outcomes in this program in terms of achievement rates are necessary for it shows the efficiency and success of the curriculum implementation. However, the quality of Philippine basic education has been deterioratingbased on the latest National Achievement Test (NAT) result in 2015. In fact, DepEd-Samar Division as one of the institution pursuing educational excellence in Samar province was experiencing such abrupt declination of NAT in the area of Mathematics in higher level where elementary NAT average result

of 32.58 with 81.45 Mean Percentage Score (MPS) and 2.88 standard deviation is far way better compared to the mean average NAT result in high school of 34.72 with 69.43 MPS and 5.42 standard deviation. Maybe these results are affected by the curriculum shifting from Revised Basic Education Curriculum (RBEC) to K to 12 and how the implementers of the curriculum utilized spiral approach as new technique to teaching.

The poor performance results according to De dios (2015) might due to inadequate preparation of high school students to apply and execute the fundamental skills taught in the new curriculum.This years' Grade 6 student were the first batch to fully complete the K to 12 Basic Education. Thus, prior knowledge of this years' high school students enrolled under K to 12 program were from the former RBEC curriculum.InRBEC, lower Mathematics were introduced first before having higher Mathematics compared to the new spiral approach of K to 12 in which revisiting of topics happens throughout the course and requires deepening of it in every successive encounter (Cruz, 2012). Perhaps, the needed competencies which must be acquired in elementary spiral approach were missed by high school students.

Mass promotion could also be one of the issues affecting students' poor performance in Mathematics. De Guzman (2014:4) believed that with the implementation of K to 12 program, many schools mass accelerated making their students skip a grade level to re-align themselves with the K to 12 program. To many parents, this meant extra savings for a year's tuition fee. To many schools,

it gave them an opportunity to offer a good bargain and to attract more enrollees. But to the students, the effect is damaging leading to dismal implementation of spiral Mathematics in the K to 12 curriculum.

Valbuena's (2012) resistance on the other hand about this program implementation, mainly comes from their belief that the country's lack of budget, preparation, and readiness for the new reform would affect K to 12 operations and having weak performance in students' achievement will emerge.If the country had prepared for this implementation and if the government had analyzed this well maybe there would be no apprehensions and its effect will be seen immediately. But as early as now, the dropout rate increased in public school, teachers as well as children were confused. There won't be problems like these if the government prepared for and studied K to 12 spiral approach, and if this was started with students in Kinder.

Moreover, teachers' confusion with spiral implementation arose because they were ill-equipped to adapt to these changes in the curriculum. The trainings conducted by DepEd as it rolls out the K to 12 implementation is definitely not enough for the teachers be equipped with the this new trend in education. Until now, some teachers remain clueless about its implementation policy.They may be engaging and creative when it comes to teaching but lack the skills to handle complex topics because of limited knowledge about the program implementation of spiral curriculum. If the teachers were confused with such enactment, how much more of the child's capacity to adjust with this new approach (Umil, 2013).

Availability of learning materials could also be one aspects affecting implementation efficiency of the curriculum as what Legaspi (2014) had observed.For the last three years, high school students had to photocopy workbooks for their own as there were no learning materials in Mathematics issued by the Department of Education. On the other hand, during the school year 2013-2014, the textbooks were delivered late both inelementary and secondary schools in Paranas, Samar. It arrived during the 3rd and 4th quarters and before these books arrived, teachers had to photocopy materials and distribute these to their students.Until now, the availability of learning materials is just one of the problems still hounding the country's new basic education program in its six years of implementation.

Instructional materials as mentioned led to teachers own resolve to makes use of the learning materials of the previous curriculum. However, Hegina (2015) claimed that this outdated reference material in schools as replacement could complement the new curriculum. But this won't guarantee that this tool be parallel to the spiral policy utilized in the curriculum. Besides, instructional materials as someone has recommended it to be "a really good resource" does not ensure it will be effective in meeting the needs of the students in spiral mathematics. Thus, continuous usage of this learning tool as what Corpuz(2014) has said increases the number of students struggling in mathematics since the sequencesand competenciesof the topic is not followed.

With the aforecited information and ideas, the researcher comes up with this problem exploringthe efficiency implementation of K to 12 spiral curriculum towards the mathematical performances of the students as well as analyzed the identified existing factors that hinders its effective implementation.

Statement of the Problem

This study determined the operational efficiency of K to 12 spiral approach in Mathematics among Grade 6 &Grade 10 students inthe sevenselected elementary and secondary schools of Samar Division, particularly located in Paranas, Samar for the school year 2017-2018.

Specifically, it sought answers the following questions:

1. What is the profile of student-respondents in terms of:

    1.1 age and sex;

    1. 2 grades in Mathematics?

2. What is the students' level of proficiency of Grade 6 and Grade 10 based on the K to 12 spiral proficiency assessment in Mathematics?

3. Is there a significant differenceon the assessment result of Grade 6 and Grade 10 respondents based on the administered spiral proficiency assessment?

4. Is there a significant relationship between the student-respondents profile and the assessment result?

5. What is the profile of the teacher-respondents in terms of:

4.1 educational background;

4.2 length of service in teaching;

4.3 seminars/trainings attended in K to 12 Mathematics; and

4.4 used instructional materials?

6. Is there a significant relationship between the level of proficiency of the student-respondents and the profile of the teacher-respondents?

7. What are the teacher-respondents' perspectives on the implementation of Mathematics spiral approach in the K to 12 curriculum?

8. What is the operational efficiency of K to 12 Spiral Approach in Mathematics?

9. What strategies may be recommended to enhance Mathematics performance of K to 12 Spiral Approach?

Hypotheses

The following hypothesis were formulated and tested in the study:

1. There is no significant difference on the assessment results of Grade 6 and Grade 10.

2. There is no significant relationship between the student-respondents' profile and assessment results.

3. There is no significant relationship between the level of proficiency of the student-respondents and the profile of the teacher-respondents in terms of:

3.1 educational background;

3.2 length of teaching experience;

3.3 seminars/trainings attended in K to 12 mathematics; and

3.4 used instructional materials.

Theoretical Framework

This study centered on the Elaboration theory (Reigeluth& Stein, 1999:341-342) stating that an instructional design of content to be learned should be organized from simple to complex order, while providing a meaningful context in which subsequent ideas can be integrated. Through this, instruction is made out of layers and that each layer of instruction elaborates on the previously presented ideas. By elaborating the previous ideas, it reiterates, thereby improving retention.

This layering as emphasized by Reigeluth(Reigeluth& Stein, 1999:341-342)has a zoom lens sequencing approach that runs from simple to complex and repeated from general-to-specific. This zoom lens approach first looks at the subject through a wide-angle lens. That is, the subject matter is general and fundamental. This allows us to deal with the core aspects of the subject and elaboration begins with an overview of the simplest and most fundamental ideas of the subject. Then as one attempts to zoom, complexity of the topic increases so that we will focus in some details and thoughts about the subject matter.

As it continues to zoom, it goes into great detail with each repetition or layering. Note that we are primarily concerned with the sequencing of ideas and

each zoom that we make is called a sequencing of the topic. Sequencing in this case relates to fundamental ideas or core principles. The basic ones are presented first, this in turn, leads structured knowledge. Structured ideas or principles are called epitomes in elaboration theory. The epitome serves as a foundation from which more specific information may be developed.

The afore-cited theory explained the essence of in-depth attention that teachers must render in the proper utilization of spiral approach in teaching for it will affect the way how students acknowledge and apply the concept in any classroom setting. Doing this would result to students' active engagement and attainment of the lesson objective for a long term memory and application.

Conceptual Framework

The conceptual framework found in Figure 1 on the succeeding page illustrates the totality of how the study was conducted.

At the base of the schematic diagram are the respondents of this study which are the Grade 6 and Grade 10 students,enrolled during the school year 2017-2018, in the seven targetedelementary and secondary schools namely: Lawaan ES, Lawaan NHS, Casandig ES, Casandig NHS, Tenani Integrated School, Wright I CES and Wright NHS under the supervision of DepEd Samar Division including their Mathematics teachers.

Findings on the efficiency implementation or operation of the spiral approach was revealed and its impact towards the educationalsystem of the

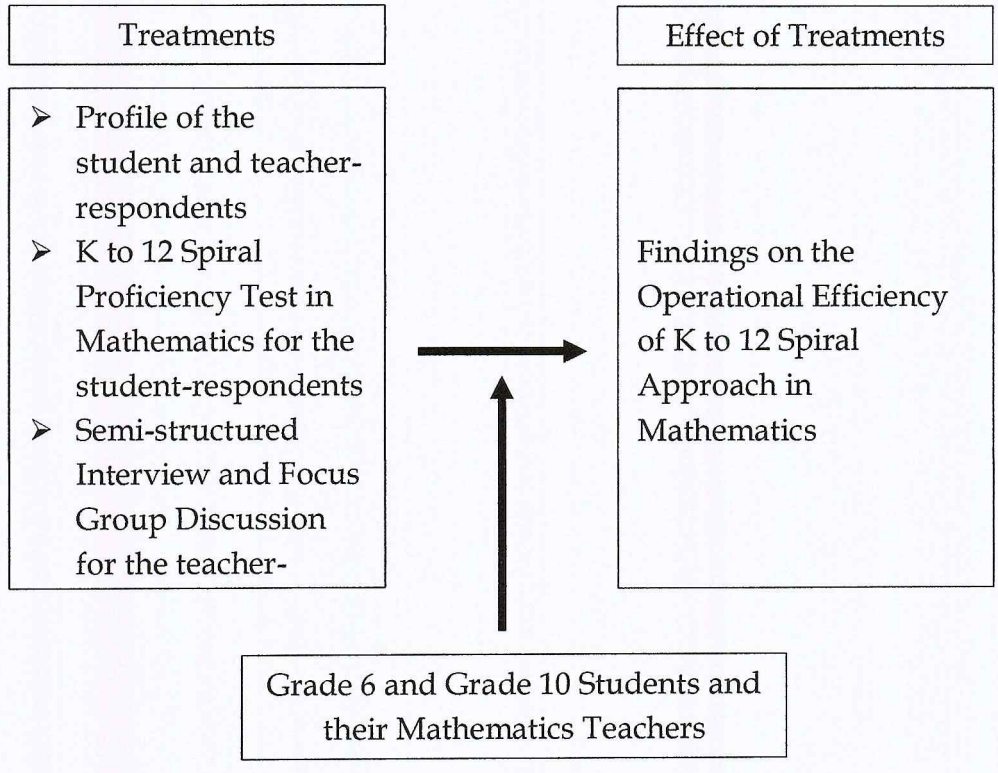


Figure 1. Conceptual Framework of the Study

Philippines were examined through statistical analyses on the respondents of this study which was based from students and teachers' profile, result in the administered proficiency test in K to 12 spiral assessment for the student-respondents as well as the responses of the teachers in the semi-structured interview and focus group discussion.

The result of this study provides recommendations or actions that DepEd must undertake in order to encourage everyone to implement the proper process of the program or construct additional plans in addressing some identified factors influencing efficiency implementation of K to 12 spiral approach.

Significance of the Study

The findings of this study would be of great help and will give benefit to the following individuals.

School Administrators. The result of the study will serve as path in evaluating their teachers' effectiveness on spiral progression approach in teaching K to 12 curriculum. It will serve also as an eye-opener in conducting school-based workshops to prepare the teachers to the possible concerns and responsibilities they might encounter in teaching which is also a way to support professional growth through continuous learning and training as well as allowing them to perform efficiently in implementing the approach of the curriculum. As such, they could monitor the progress of curriculum

implementation of the teachers under his/her supervision for the learning improvement of the students.

Policy Makers. This study will give benefit to the policy makers to formulate policies or strategies in education that will meet the standards of excellence and quality education. This will further help them to think of effective plans in giving actions of the fundamental practices in education that is not practice or done incorrectly by the implementers of the program. Through this also, policy makers will be able to construct a creative and successful solution to practical problems in the conduct of such program.

Teachers. The result of this study will enhance their teaching strategies and make them aware on what varied learning activities that they must use for the lesson. They could also use the findings as the basis for making their teaching and lessons be more interesting and enthusiastic considering the individual differences of their students. Moreover, this study will help them become more efficient in teaching spiral progression in K to 12 mathematics subject.

Students. The findings of this study will help Grade 6 and 10 students evaluate their mathematics performance as well as find out how deep is their knowledge in K to 12 spiral curriculum. Through this, students would also be given opportunity to properly reflect on the essence of spiral approach in developing their study habit and performance in mathematics. Also, this study gives more opportunity for every student the chance to address the gap between their level of competency and proficiency with the mathematics concept.

Parents. This study will help parents be more aware with their essential role in students' achievement. They can fully give their support with the school's goal like attending regularly the school's homeroom or general meeting so that they will be informed with their child's learning progress and development. This will also help the parents to monitor their child's behavior and progress in school and assist them to be responsible with their studies.

General Public. This findings of the study will help the community to be aware about the implemented educational policy in our country. They could understand educators' vision towards educational excellence and could realize their important role as stakeholders of the society. They could also give their support once they know the significant impact of this research study to their community and could strengthen further any related school-community activities.

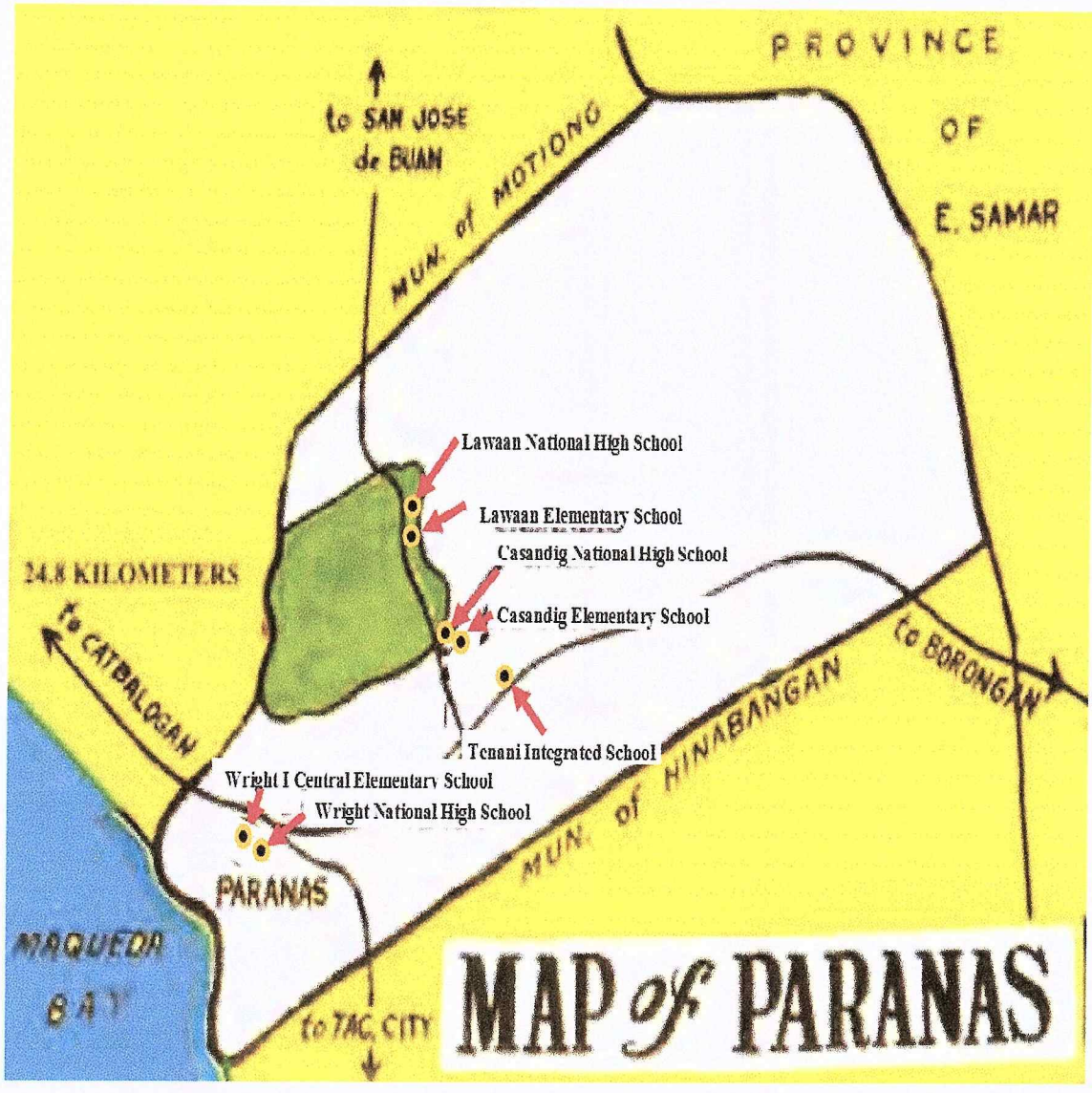
Future researchers. This study would be very beneficial to the future researchers for it will serve as a guide or basis in pursuing a study related to efficiency implementation of spiral approach in K to 12 curriculum. This will give them more ideas and insights about new useful researches that will help not only to the subjects of this study but also to the community. It will also develop their creative and critical thinking in brainstorming a new research topic related to this study.

Scope and Delimitations

This study assessed the operational efficiency of K to 12 spiral approach in Mathematics performance of Grade 6 and Grade 10 students including their Mathematics teachers in the seven selected elementary and secondary schools of Samar Division. This targeted schools shown in Figure 2 were located in the municipality of Paranas, Samar namely: Lawaan Elementary School, Lawaan National High School, Casandig Elementary School, Casandig National High School, Tenani Integrated School, Wright I Central Elementary School and Wright National High School.

Along the areas that were assessed are: the proficiency level of the Grade 6 & Grade 10 students involved in this study, profile of the student-respondents in terms of their age, sex and grades in Mathematics as well as the profile of the teacher-respondents in terms of their educational background, length of service teaching, seminars/trainings attended in the K to 12 program and the materials used in instruction. Likewise, teacher-respondents' answer to the semi-structured interview and focus group discussion based on the assessment result of the students and the implementation status of K to 12 program was also considered in this study.

The student-respondents involved in this study are 470 in which 307 of them were Grade 10 Junior High School students and 163 Grade 6 students under K to 12 program enrolled during the school year 2017-2018 while the teacher-respondents involved are 37 consisting of 25 elementary teachers and 12



Legend:

- Samar Province
- Ocean
- River
- School-Respondents

Figure 2. Locator Map of School-Respondents in Paranas, Samar

Junior High School teachers handling Mathematics subject. With the help of the survey or proficiency assessment questionnaire for the student as well as the semi-structured interview questionnaire and focus group discussion for the teachers which serve as the main instrument for this study, the data needed for the study were tallied, tabulated and interpreted using mixed-method statistical tools.

Mixed-method statisticalanalyses were applied in treating: (1) quantitative data through the use of frequency count, conversion of percentage, mean, mode, standard deviation, Pearson product-moment correlation coefficient or Pearson r, z-test analysis for two groups, Spearman Rank and Point-biserial correlation analysis; and (2) qualitative data as supporting inputs in analyzing & attaining the goal of the study based on teachers' responses in the interview and focus group discussion.

Finally, the study was conducted during the school year 2017-2018.

Definition of Terms

To give the reader a better understanding on the textual presentation of this thesis manuscript, the following terms are hereby defined conceptually and operationally.

Basic Education Curriculum. This term refers to set of standards given to students to learn basic education in the Philippines from primary to high school and focuses on the basics of reading, writing, arithmetic, and values integration

(Santos et al, 2009:29). In this study, this refers to program of the Department of Education in which learning and mastery of concept could be attained in elementary and secondary classes.

Competency. It refers to the capability of an individual to apply or use a set of related knowledge, skills, and abilities required to successfully perform critical work functions or tasks in a defined work setting (Sturgess, 2012). In this study, this refers to objective of the lessonsuggested in K to 12 curriculum guide which serve as the basis in assessing the level of knowledge and skills of the students.

Educational Background. This refers to the education that a person has undergone. It begins with Kindergarten and ends with Post Graduation College or additional Technical Training (Robert, 2016:4). In this study, these are the formal schooling attended/attained so far by the teacher-respondents.

Efficiency. This term refers to quality or level of performance of being able to do a task successfully (Collins, 2014). Operationally, this term refers to the effectivity implementation of spiral Mathematics in the K to 12 curriculum based on the teacher-respondents' viewpoint and perspective on its present implementation.

Grade 6 Students. Conceptually, this is the sixth school year after kindergarten. Students are usually 12-13 years old (Standard Course of Study, 2014). Operationally, these are students in the last level in elementary education under K to 12 basic education program in the Philippines.

Grade 10 Students. Conceptually, this is the tenth school year after kindergarten. Students are usually 15-16 years old (Standard Course of Study, 2014). Operationally, this term refers to the last level in Junior High School education under the K to 12 basic education program in the Philippines.

Instructional Materials. The term refers to something used in teaching and delivering the lesson (Rancher, 2016:5). In this study, it refers to the materials and teaching aids used by Mathematics teachers in teaching.

Junior High School. This term is also known as middle school or intermediate school where educational stage exists and takes place between primary school and high school and usually includes grades seven to nine students in other countries (Cruz, 2012). In this study, this is part of four-year training in high school education of the K to 12 program containing students enrolled in Grade 7 to Grade 10 level.

K to 12 Program. It covers Kindergarten and 12 years of basic education (six years of primary education, four years of Junior High School, and two years of Senior High School) to provide sufficient time for mastery of concepts and skills, develop lifelong learners, and prepare graduates for tertiary education, middle-level skills development, employment, and entrepreneurship (Cruz, 2012). In this study, this refers to the current program utilized by DepEd in which student-respondents involved were enrolled in this program.

Length of Service. This term refers to longevity; duration of service or employment. Often used to indicate how long an employee has worked at a

company or an individual has belonged to an organization (Mulligan, 2016). In this study, this refers to the numbers of teaching experienced rendered by a teacher in Department of Education.

Mathematics Performance. This term refers to the result of education in Mathematics subject, the extent to which a student, teacher or institution has achieved their educational goals (Magnuson, 2007:1497). In this study, this refers to the performance of the Grade 6 & Grade 10 students in Mathematics and which is translated into scores and ratings based on the competence or skills of the students involved.

Operational Efficiency. Thisterm primarily refers to the measures of implementation extent of a policy with the underlying factors influencing its effectivity(Beal, 2014). In this study, this refers to the efficiency implementation of K to 12curriculum when evaluated according to students' proficiency level, teachers' perspective and their outlook towards the operational process of K to 12 spiral Mathematics.

Proficiency Level. The term refers to the advancement and competence as evaluated using standardized test (Collins, 2014). In this study, it refers to the level of proficiency of Grade 6 and Grade 10 students when evaluated using the teacher-made proficiency assessment in Mathematics.

Spiral Approach. This can be defined as a course of study in which students will see the same topics throughout their school career, with each encounter increasing in complexity and reinforcing previous learning (Corpuz,

2014). In this study, this term refers to the new technique applied by the teachers in DepEd where students' skills are developed through revisiting Mathematics competenciesin every grade levelwith increasing depth and mastery of the lesson.

Teacher Trainings. This term can be definedas policies, procedures, and provision designed to equipteachers with the knowledge, attitudes, and skills required in performing their tasks effectively in the classroom, school, and wider community (Lim, 2016). Operationally, these are the seminars or workshops attended by the teachers under K to 12 program enhancing their teaching skill and perspective towards teaching.

Chapter 2

REVIEW OF RELATED LITERATURE AND STUDIES

This chapter presents the related literature and studies taken from the published and unpublished materials conducted locally and in abroad to highlight significant results. Discussed here also are the similarities and differences of the present study and the previous studies.

Related Literature

A recent change in the Philippines' educational system was implemented. Changes to the educational system are intended to better equip students for employment and further study both at home and abroad. As Abueva (2015:3) has said, the 12-year basic education curriculum that DepEd seeks to design is the one which hopes to address the basic inadequacies of the current curriculum, particularly, to equip the students with the indispensable skills that will prepare them to face the world of work after the end of the 12 years.

Cruz (2012), an education expert, noted that changing the curriculum is a daunting task. It is not just a matter of adding a subject here and removing a subject there or introducing a new strategy but it involves a more holistic approach that takes into consideration a lot of factors such as the duration, the content, and the competencies expected on it. Considering these aspects and

itseffect to teaching can improve the learning progress of the students who are the primary client in this program.

In the regional consultation conducted in Naga City involving academicians and administrators in the Bicol Region from both public and private sectors, it was observed that the deterioration in the quality of education in the country is strongly attributable to the weakness or inadequacy in the academic and practical training of teachers. This concern has been a perennial problem in the education sector and implementing a new policy will not be successful unless an aggressive move to solve this problem is seriously made (Sergio, 2012:75).

If we are to elevate the notion of excellence in teaching, Alonzo (2015:6) put emphasis that the K to 12 program needs dedicated teachers who upgrade their competencies through continuous learning and professional development. The mass training of teachers done by DepEd by the previous years as it gradually rolls out the K to 12 program in every grade level is definitely not enough. Teachers can only create upward spirals of performance in Filipino learners if, they don't cease to learn.

In the same way, Taboh (2015:3) added that lack ofinstructional materials makes it hard for the teachers to execute their duties in teaching. The critical shortage of textbooks and other teaching and learning materials has affected the education sector.In spite the fact that government and key officials push the importance of education, they don't do nearly enough to make sure that the

education they so value is actually acknowledged because of insufficient learning materials. Thus, teachers and most especially the learners are the ones being affected.

As mentioned above, the inability to provide materials for their students is an issue that many schools nationwide face.That is why, in the absence of such learning materials aid for the learning process, the teachers tries to look for other learning tools as replacement suited to the needs and demands of the current curriculum and because of this, theshortage of textbooks is affecting the performance of students. Primary learning which takes place in elementary level is a foundation for secondary level and once it is not strong, secondary schools end up producing semi-literate students (Martinez, 2014).

At some point, De dios (2013:7) explained what is lacking in the implementation of the K to 12 curriculum in the Philippines which makes it redundant. The top performing countries (Australia, Brunei, England, Finland, Japan, Taiwan, Thailand, Singapore, New Zealand, and USA) pay attention to coherence in the curriculum. These countries choose to emphasize instead depth in the foundations of those competency disciplines. Perhaps, this is the reason behind less breadth of the concepts in the new program. The approach adopted by the US and other countries stops at the end of middle school (Grade 8 level) while the Philippines expects to achieve this only at the end of Grade 10. The kind of curriculum in DepEd's K to 12 and those of the top performing countries is the obvious fact that the curriculum in the Philippines is behind.

Tucay (2015:15) agreed to this claim that when the K to 12 program implements a spiral progression approach to teaching, subjects are intended to be taught in a manner of increasing complexity. Furthermore, initial observations show that the new curriculum is rather redundant and overall focus on basic concepts is largely diffused. The quality of instruction under K-to-12 program is also far from being assured. With the severe lack of facilities and teachers, the practice of shorter hours of instruction is set to continue.

These differences between curricula of countries, however, may still not be the explanation behind student learning outcomes. Sequencing of the topic is very important and coherence in a curriculum can be given with instructors who are specialized to teach a particular subject. A teacher who has an education degree specializing in mathematics, with or without a curriculum, would know what to teach first. There is no point in introducing a curriculum that cannot be possibly implemented correctly (De dios, 2013:10).

Theoretically, experienced teachers can teach mathematics without a textbook. However, it is not easy to do it all the time, teachers have to follow the curriculum and provide, make, or choose materials. The K to 12 program is envisioned to give the country quality education but quality education necessitates coherence from intention to implementation especially when it comes to the learning resources utilized in this program. Teachers may use a wide variety of tools to foster learning. They may adapt, supplement, and elaborate on those materials and also monitor the progress and needs of the

students and finally evaluate students. It is the teacher's responsibility to check and see whether all of the elements of the learning process are working well for learners and to reject them if they are not (Kitao et al, 1997:10).

Meanwhile, Snider (2004:31) also cautioned that a spiral curriculum often limits the depth of knowledge that students attain. He explained that in a spiral curriculum many topics are covered but only briefly. On the average, teachers devote less than 30 minutes of instructional time across an entire year to 70% of the topics they cover. As for the result of teaching, many students fail to master important math concepts. This brief, yearly exposure to the concept of any topics makes it highly unlikely that students will remember these difficult, yet essential, concepts from year to year.

The goal of spiral approach is to introduce the concept so the students will recognize it when they see it next year (Allyn & Bacon, 2009:1-2). But, what happens in reality is that, teachers are starting to introduce again the lesson since students failed to apply it when a new lesson connected to the previous one is discussed. In short, building on students' prior knowledge and skills with the concept will not be recognized and gradual mastery from one concept to another will not occur because of inappropriate implementation of spiral approach

Quijano et.al (2012) opposed to this claim thatthe utilization of spiral progression prevents incoherence between stages of teaching and allows learners to acquire knowledge and skills suitable to their developmental and or cognitive stages. The spiral approach is also believed to strengthen retention and mastery

of topics and skills as they are revisited and consolidated with increasing depth and complexity of learning in the succeeding grade levels which is now used from Kinder to year 12. There is now the so-called vertical articulation of competencies from the first grade of elementary to the last grade of junior high school compared to the previous curriculum.

Students' failure to master a concept is a present state in which retention, social promotion and the high referral of certain groups to special education are symptoms of inadequate instruction. Folks want to help all of the children learn, but their focus is on making high scores in the test rather than improving the quality of instruction. Many students who are socially promoted into high school after failing a high-stakes test and in their eighth grade, they may not be academically successful on high-stakes tests in high school, may have high school attendance and discipline troubles, and may not successfully complete high school when compared with students who have not been socially promoted (Sizemore, 2005:12).

De Guzman (2014:4) seconded this idea that with the implementation of the K to 12 program, many schools mass accelerated making their students skip a grade level to re-align themselves with the K to 12 program. To many parents, this meant extra savings of a year's tuition fee. To many schools, it gave them an opportunity to offer a good bargain to attract more enrollees. But to the students, the effect is damaging. It is similar in using a "kalburo" (calcium carbide – a chemical use to quickly ripen fruits) to make sure the mango ripens quickly so it

can be sold right away without considering its natural development. In reality, incomplete training leads to a high possibility that students will struggle to learn.

Same as true with what Warren (2014:6) discovered when she conducted a case study. Eventually after reviewing all of the student records from kindergarten to 8th grade, she realizes that there was a serious breakdown (attendance, test scores, etc.) on the meaning of grades and what the expectations were to earn in passing the subject. She realized the real issue. Most of her students were in high school due to social promotion. It is even more disturbing to know that students' reading level entering in high school is at or below a sixth grade level. Despite the efforts of the teachers in making sure that their students will learn and progress, however, there are times that students really didn't see the connection in their mastery of work and their final grades.

Similarly, Ginsburg (2012:9) believed that spiraled instruction stifles learning. Topics were touch every year, then review the same material the next year and a year after that. The problem, of course, goes back to the disconnection between kids seeing something and actually learning and retaining it. If it didn't sink in for them the first, second, or third time as teacher presented it to them, then why should we present it again? Instead of spiraling, in a form of "touch-and-go" instruction, teachers should spiraled practice. Emphasizing of topic must begin right after students are first introduced to a concept or skill and continues for the rest of that year and subsequent years.

It will take years to evaluate if the curriculum is effective and attuned to the needs of the learners and the society. Regardless of the "extra years" if the school can't provide that quality education to every student because some Filipino teachers are not skilled enough to motivate students to excel, then for sure all will end in vain. Still, students will be left behind to work on their own to become skilled enough for the jobs they seek to have. One cannot really say that the spiral progression approach in teaching mathematics is really effective in the Philippines. Evaluation of this approach is a must to determine if like in other countries in which this approach was abolished from their educational system after a certain period of time (Del Rosario, 2014:15).

The ideas and principles discussed in the aforecited paragraphs provides valuable insights to the researcher which served as important background information for this study.

Related Studies

This part discusses the significant studies that were considered helpful and relevant to the present investigation.

Masayon (2004) assessed the implementation of the Basic Education Curriculum in Balangiga District for the school year 2003-2004. She found out that the objectives of the curriculum, integration achieved of the concepts in the following learning areas particularly in Filipino and Makabayan were to a great extent attained. Whereas, English, Science and Mathematics were to a moderate

extent achieved as well as the utilization of instructional materials and facilities were to a moderate extent when used. Basic Education Curriculum in the said district, in general, is to a moderate extent when implemented. She concluded that teachers and administrators have the same perceptions on the attainment of objective. She highly recommended that teachers must continue adapting a comprehensive program to determine the pupils' rate of learning and measure as well the teaching effectiveness. Administrators must conduct a regular periodic monitoring of teachers to assist the quality of materials used.

The study of Masayon revealed significant in the conduct of the present study in terms of its goal in assessing the efficiency of the implemented curriculum. Also, relationship of the variables was also considered in both studies. However, the two studies differed in terms of the other type of variables, the type of respondents involved, the subject area covered, research environment and the program to be investigated in this study.

Davis (2007) investigated "The Effects of an Experimental Spiral Physics Curriculum Taught to Sixth Grade". She compared the effectiveness of using an experimental physics curriculum to a traditional linear physics for sixth through eighth grades students. She also surveyed students' parents and principals about students' academic history and background as well as identified resilient children's attributes for academic success. Both the experimental spiral physics curriculum increased physics achievement, however, there was statistically significant difference in effectiveness of teaching experimental spiral physics

curriculum in the aggregated sixth grade group compared to the traditional linear physics curriculum. Findings revealed also that teachers' attitudes, beliefs, and strategies were heavily shaped not only by the immediate needs of their classrooms, but also by a confluence of macro-level structures. This, in return is affected by how they executed their discretion and met their obligations as street-level bureaucrats.

The study of Davis has a similarity on the current study in terms of the type of approach taught. Furthermore, both studies investigated the effects of the spiral curriculum in a subject taught from those prior knowledge are from the old curriculum. However, the study of Davis focused on the experimental effects of spiral approach in teaching Physics. It also considered parental and principal view of the student's achievement. Meanwhile, the current study focus only on the efficiency operation of K to 12 spiral curriculum approach of6th and 10th grade students in Mathematics subject.

Skinner (2011) researched on the "Spiral Assessments: A study in an Accelerated Mathematics Classroom". The study compared one year of Accelerated Math 2 students who received no spiral assessments throughout their course to the following year of Accelerated Math 2 students who received numerous spiral assessments. In addition, the spiral group was given appropriate feedback about their assessments as well as positive changes to their learning environment based on the assessments. Students were surveyed about whether or not spiral assessments led to improved attitudes about mathematics

and if the practice raised confidence in their mathematics abilities. Finally, this study used a focus group of ten math teachers and interviews of two administrators to determine if a spiral assessment practice was feasible for broader implementation and if it would be supported by the faculty and administration at the school. Overall, this research study produced positive results with regards to content retention and student confidence in mathematics.

The former study is relevant to the present study in terms of the variables involved such as the two groups of student-respondents particularly the tenth and sixth grade students as well as the approach used in the study. Nevertheless, it differs in terms of the methodology used under K to 12 program, as significant basis in assessing the ideas and perspective of the teacher-participants towards operational efficiency of K to 12 spiral approach. It also differs in terms of the area covered and methodology utilized in this study.

Lacorte (2014) study about "Readiness of the Implementation of K to 12 Program in selected Private and Public Schools in Quezon ". The variables as to school readiness in terms of curriculum adjustment, school plans and facilities, administration and management; and those of teacher's readiness are teaching competencies, teaching strategies and instructional materials were examined. Results revealed that schools maintain and even bring to a higher level their readiness in the implementation of K to 12 through adopting more innovative trends, improving their facilities and preparing themselves for globalization through utilization of multimedia. In terms of teacher's readiness, teachers

maintain and strengthen further their readiness in the implementation of K to 12 through attending more in-service training and seminars related to K to 12. They are more resourceful and creative by keeping themselves abreast of the current educational trends.

Furthermore, the study of Lacorte suggests that teachers and school heads should find enough time conferring with parents by institutionalizing a program where a regular orientation, and consultation not only with the students but also with other stakeholders, particularly the parents (eg., during HSA meetings, forums), so that the former may know their problems related to the implementation of K to 12 and that they may provide assistance for the parents and their children. This move will empower the parents and will have them realize their significant role as partners of the school in furthering and meeting quality education for the students. Likewise, this will further strengthen school-community relationship.

The study of Lacorte is significantly related to the current study for it cited somehow similar variates which associates or affects the performance of the students in school. However, it differs in terms of focus and goal of the study which is the determination of the operational efficiency of spiral Mathematics in the K to 12 curriculum.

In the study of Resurreccion&Adanza (2015) on "Spiral Progression Approach in Teaching Science in Selected Private and Public Schools in Cavite". Results showed that, after utilizing the mixed-method design in which

interviews, questionnaires, and observation were used to gather data, spiral progression approach had greatly influenced science curriculum particularly the content and transitions of the four areas in science, the secondary schools, the learners, and especially the science teachers. Based on the findings, science teachers were still adapting to the new curriculum. They needed more time and trainings to master all the fields and to learn new teaching strategies. Teachers are having hard time adapting to the new approach, particularly those who have specializations and have been teaching for so many years. However, they also believe that through this we can create a globally competitive and dynamic learners and citizens.

The study of Resurreccion&Adanza is related to the present study for it has the same instruments used in this study such as interview and questionnaire. However, the current investigation focused only in public school and in Mathematics subject. The two studies differed also in terms of the other type of variables, the type of respondents involved, method and statistical procedure to be used and the area covered of the studies.

Ferreol (2015) studied on "From Policy to Practice: An analysis of the Factors Affecting Ground-level Execution of the K-12 Basic Education Program in the Philippines". She conducted a semi-structured interviews with 71 teachers and administrators across four Philippine private schools and five public schools in the National Capital Region. Questions ranged from participants' day-to-day experiences of the implementation process to their attitudes towards the policy

itself. These interviews aimed to broadly answer the question: what factors affect the ground-level execution of a newly instituted education policy? Findings revealed that teachers' attitudes, beliefs, and strategies were heavily shaped not only by the immediate needs of their classrooms, but also by a confluence of macro-, meso-, and micro-level structures. This, in turn, affected how they executed their discretion and met their obligations as street-level bureaucrats.

The study of Ferreol showed similarity to the present study since both studies are into the analyses of the implementation efficiency of K to 12 Education program and how it affects the learning development of the students through the same approach in gathering data. The only point of difference of both studies is that, the two studies differs in terms of locale, research respondents, and the subject area.

Legarse (2015) studied on "Proficiency of Grade 7 English Teachers and Their Readiness for the Implementation of the K to 12 Curriculum". Questionnaires and proficiency test, as well as unstructured interview were used to gather data which served as bases of the formulation of faculty development program for the English teachers of Samar Division and Catbalogan City Division. The results showed that the grade 7 English teachers were highly proficient in vocabulary and moderately proficient in the use of English and reading comprehension. Furthermore, the attitude of the key officials, teacher, and students towards the k to 12 implementation was favorable. The teachers were ready to implement the k to 12 curriculum in terms of knowledge of

curriculum content, utilization of teaching materials and utilization of instructional methodologies; whereas, they were moderately ready to implement or to use instructional media. Moreover, the faculty development program intends to support the English teachers in their quest for professional development that are geared toward achieving educational excellence; and to strengthen the competency and proficiency of the grade 7 teachers as well as re-orient them to deepen awareness as catalyst or promoters of change.

The study of Legarse showed similar variables with the current study since variables like the profile of the teacher-respondents was tackled, their view towards the educational curriculum were also utilized in this study. However, the two studies differ in terms of the methodology to be used and the covered area for research. It will be focusing only to the selected schools in Samar Division. Also, if the former study investigated teacher's proficiency and their readiness in the implementation of K to 12, the present study will be investigating the aftermath of the implementation in mathematics subject.

Argote (2016) researched on "Spiral Progression Approach: The Phenomenological Plight of Science Teachers". In her study, it reveals that teachers still have misconceptions or misinterpretations about the Spiral Progression Approach. Outcomes also confirm that despite revisions in Curriculum due to the implementation of Spiral Progression Approach, teachers still reveal constructive experiences. However, when unconstructive experiences steal the limelight, student-teacher travails surface. Participant of the study, too,

were expectant that an evaluation body will come into view so that some defective instructional and learning materials might be reviewed, corrected and updated.

The study of Argote is relevant to the current study for the reason that they have the same target of respondents, the teachers, and have the same approach used in the implementation of the K to 12 curriculum except on the research environment, respondents, and the specified factors that might affect the performance of learners based on the point of view of teacher-respondents.

Chua (2016) conducted similar study entitled "Implementation Status of the K to 12 Grade One Basic Education Curriculum in Tacloban City Division". He employed comparative analysis of the implementation of K to 12 in terms of level of perceptions of the administrators and teachers on the curriculum along with content, strategies used, assessment of pupils learning, facilities and management among teachers and administrators. Results showed that the adequacy levels of instructional facilities as perceived by the administrators are moderately adequate while the teachers find it inadequate. The administrators and teachers perceived the curriculum as difficult to understand because of the technical words used. As for strategies used in the subject areas, administrators and teachers perceived that it is time consuming in a classroom set up. For the assessment of pupil's learning, the use of checklist and performance rubrics is quite unfamiliar.

The study of Chua is related to the present study for it considered the possible relationship of certain identified variables on the implementation of K to 12 curriculum. However, the two studies differed in terms of the other type of variables, the type of respondents involved and the area covered of the study. Also, the current investigation focus only on mathematics performance and their proficiency level based on the administered proficiency test of the students in the spiral curriculum.

Another study of Caspe (2016) entitled "Implementation of Grade 7 Science Curriculum in the K to 12 Program in District I of Eastern Samar Division". Utilizing a survey questionnaire and through the use of Pearson r and t-test statistical tool, it revealed that the teacher-respondents were competent in teaching science as perceived by themselves except on the evaluation tools which they were slightly competent as perceived by the science supervisor. On the relationship of teacher factors and teaching competencies, secondary science teachers has a high significant relationship.

In the same vein, the science supervisor perceived a significant relationship between oral skills with formulation of objectives; interaction style in teaching; educational qualification with almost all areas in teaching objectives; art of questioning and use of varied strategies. As a whole, teachers being dynamic in his/her career has a high chance of success in delivering the effective teaching and learning competencies through active engagement in the variables cited in the implementation of the curriculum. However, high possibility of

failure in attaining effective learning will occur if incorrect application to their way of teaching is practice.

The study of Caspe is related to the present investigation for it focuses on the implementation in K to 12 curriculum in science subject which is the primary focus of the current investigation but in mathematics subject. Though it differs in the subject area taught but it can be grounds for perception comparisons and a perspective and views of the teachers to the new implemented curriculum.

The foregoing review of related studies played salient role which made the present study successful. The ideas and information taken from the previous studies served as foundations as well as input to further improve and contribute to the accomplishment of this study.

Chapter 3

METHODOLOGY

This chapter presents the methodology and procedures employed in the conduct of the study including research design, instrumentation and its validation, sampling procedure, data gathering procedure and statistical treatment of data.

Research Design

This study utilized descriptive research design with comparative analyses assessing the efficiency implementation of K to 12 spiral approach in Mathematics curriculumas perceived by the 6th and 10th grade students including their Mathematicsteachers. Seven selectedelementary and secondary schools, particularly located in the municipality of Paranas, Samar under the supervision of DepEd - Samar Division were investigated in this study for the school year 2017-2018.

The statistical analyses were done in this manner: First, the researcher determined the teacher and student-respondents' profile as well as the level of proficiency of the Grade 6 and Grade 10 students using a teacher-made proficiency test measuring student's competency in the implemented spiral curriculum of K to 12 Mathematics,compared the assessment result of Grade 6 and Grade 10 students, correlated students' profile to their level of proficiency

and determined the relationship between the teachers' profile and the level of proficiency of the student-respondents.

Second, the researcher investigated teacher-respondents' perspective and views on the implementation of spiral approach in the K to 12 Mathematics curriculum and determined its efficiency in the educational system as operated by the teacher-respondents through the use of a semi-structured interview and focus group discussion.

The data gathered in this study was subjected to two statistical/research analyses in terms of dealing: (1) quantitative data through the use of frequency count, conversion of percentage, mean, mode, standard deviation, Pearson product-moment correlation coefficient or Pearson r, z-test, Spearman Rank and Point-biserial correlation analysis; and (2)qualitative data as supporting inputs in analyzing & attaining the goal of the study based on teachers' responses in the interview and focus group discussion.

Implications were drawn from the findings of the study in determining the operational efficiency of spiral approach in Mathematics as well as make suggestions for improvement or in addressing the identified factors that hinders its effective implementation.

Instrumentation

As stated, this study employed a proficiency test, semi-structured interview and focused group discussion as the main data collection tool which

augmented by the application of documentary analysis in order to accurately gathered the desired data.The utilization of the said data collection instrument and method is discussed below:

Proficiency Test. This student proficiency assessment questionnaire was intended to gather the desired data directly from the Grade 6 and Grade 10 students under K to 12 Basic Education Curriculum. A separate set of Proficiency Test was made for Grade 6 and Grade 10 respondents.Part I was designed to gather the profile of the student-respondents such as: age, sex, and grades in Mathematics.Part II was intended to assess the student-respondents' competence in K to 12 spiral Mathematics in elementary (Grade 6) and Junior High School (Grade 10).It comprises of varied questions of concepts found in thecompetencies of the curriculum guide as well as in the learning materials utilized by the students or lessons which was discussed to them by their Mathematics teachers.

The level of proficiency of the students were identified through the scores obtained by them in the proficiency test. In rating of students' scores, their proficiency level was categorized according to the grading scale and its corresponding descriptors as stated in DepEd Order No. 31 series of 2012 as to: Advanced (90% and above), Proficient (85-89%), Approaching Proficiency (80-84%), Developing (75-79%), and Beginning (74% and below). Thus, students' proficiency level in the K to 12 spiral mathematics proficiency assessment was based on the promulgated instruction of DepEd.

The Used of Form 138-A (Report Card)/Grading Sheets. This was utilized to gather quantified data from the student-respondents in their 1st and 2nd grades if the students fail to remember his/her grades in Mathematics. These grades were taken from the records of the class adviser or from the grade sheet of their Mathematics teacher.

Survey Questionnaire. This survey questionnaire was intended to gather the needed data from the teacher-respondents who hones the skills of the student-respondents from elementary to junior high school level. It was designed to collect the profile of the teachers as to: educational background, length of teaching experience, seminars/trainings attended in K to 12 Mathematics and used instructional materials.

Semi-structured Interview and Focus Group Discussion. This is intended to gather information from the teacher who handles the student-respondents from Grade 1 to their final year in Junior High School. In this process, the researcher utilized an in-depth group interview via semi-structured type in which the participants are allowed in free rein considering that what the participant said is, or might be relevant (Yin, 2011:133). The researcher used a questionnaire in soliciting participant's perceptions, opinions, beliefs and attitudes on the implementation status and efficiency of the approach used in K to 12 Mathematics curriculum. All of the responses acquire from the teacher-participants were saved in the audio-recorder for the analyses of the overall data.

Validation of Instrument

The research instrument undergoes the following validation procedures: (1) item analysis for test validation, (2) Kuder-Richardson reliability testing, and (3) through expert validation.

First, the researcher utilized a teacher-made proficiency test consisting of 60-item questions which was administered to 10th grade students of Motiong National High School and 6th grade students of Motiong Central Elementary School for pilot testing. It contains questions which was aligned in the competencies of the K to 12 curriculum or discussed relatively to them by their Mathematics teachers. Afterwards, an item analysis was made to test the effectiveness of the questions in the proficiency test. This was patterned to the procedure made by Concepcion (2015:473-475)in validating the test questions in the proficiency test.

In this process, the researcher ranks the scores of the students from the highest score to lowest score. Then, 27% of the papers within the upper performing group and 27% of the papers within the lower performing group are selected for item validation. The remaining 46% of the papers are set aside because it is not needed for the item analysis. The students in the upper and lower groups was tallied and tabulated. Then, index of difficulty and discrimination was computed in every item using an excel program. Index range and level of difficulty were identified as well as the discrimination index in evaluating the item.

And then, to measure the reliability of the test, Kuder-Richardson Formula 20 (KR-20), which estimates reliability that provides information about the degree to which the items in the test measure the same characteristics, was followed to check the internal consistency of measurement with dichotomous choices. This KR-20 was used for items that have varying difficulty since some items might be very easy to others and very much challenging to some students. Values ranges from 0 to 1. A high value indicates high reliability while, too high if value (in excess of .90) indicates a homogeneous test (Concepcion, 2015:477).

When the researcher had verified and organized the proficiency test questions through an item analysis,it was reduced down to 40 items from 60 questions which was revised and improved when an item analysis and reliability testing was conducted. The remaining 20 questions was rejected.

At the same time, a semi-structured interview question was constructed for the teacher-respondents. After the researcher constructed the questionnaire for the student and teacher-respondents, it was submitted for validation by consulting her adviser or the research-personnel who were knowledgeable in instrument development. They provided inputs for the revision of the instrument. The comments and suggestions were considered in the revision of the instruments into the formulation of the new questionnaire.

Sampling Procedure

The respondents of this study are Grade 6 and 10 students under K to 12 Basic Education Curriculum enrolled during the school year 2017-2018 in the following respective elementary and secondary schools of Samar Division namely: (1) Lawaan Elementary School, (2) Lawaan National High School, (3) Tenani Integrated School, (4) Casandig Elementary School, (5) Casandig National High School and (6) Wright I Central Elementary School and; (7) Wright National High School including the Mathematics teachers who handle these students.

In as much as the population of Grade 6 and Grade 10 students is large, stratified random sampling technique was utilized. In this process, samples were selected based from the computed strata size of Slovin's Formula with 5% margin of error as shown in Table 1. From 183 and 439 total population in Grade 6 and Grade 10, the computed sample size was 163 Grade 6 and 307 Grade 10 students.

Table 1

Sample Frame for Student-Respondents

School	Population	Sample
Lawaan ES	45	40
Tenani IS (Elem.)	33	30
Casandig ES	48	43
Wright I CES	57	50
Total	***183***	***163***
Lawaan NHS	43	39
Tenani IS (Sec.)	38	35
Casandig NHS	90	73
Wright NHS	268	160
Total	***439***	***307***
Grand Total	**622**	**470**

In terms of teacher-respondents, twenty-five of them are elementary teachers and the remaining 12 are secondary teachers handling Mathematics subject as shown in Table 2. Total enumeration of teacher-respondents was applied, thus, there are 37 teachers identified as subjects for this study.

Table 2

Sample Frame for Teacher-Respondents

School	Teacher
Lawaan ES	7
Tenani IS (Elem.)	4
Casandig ES	6
Wright I CES	8
Total	*25*
Lawaan NHS	1
Tenani IS (Sec.)	2
Casandig NHS	4
Wright NHS	5
Total	*12*
Grand Total	**37**

Data Gathering Procedure

Right after the instruments were validated and retested, the researcher finalized her research instruments. Permission was taken first from the office of Schools Division Superintendent in a form of letter request for pilot testing and administration of the research questionnaire in the sevenselected elementary and secondary schools of Samar division. Then, this approval was used by the researcher to seek permission from the school principals allowing her to conduct the study.

The researcher, with the permission secured from Schools Division Superintendent and school principals in various elementary and secondary schools involved in this study, distributed personally the assessment questionnaire to the student-respondents with the help of the faculty staff or Mathematics teachers of the respondent schools. This has been done during their Mathematics period. The researcher obtained a 100 percent retrieval of the questionnaire.

When all the copies of the assessment questionnaire had been answered by the student-respondents, the data gathered were checked, arranged and organized using Microsoft excel in order to find out the level of proficiency of the student-respondents in the administered proficiency assessment of K to 12 spiral approach in Mathematics.

Upon determining the level of proficiency of the student-respondents, the researcher went back to the research environment to conduct a semi-structured type of interview and focus group discussion acquiring information from the Mathematics teachers who handle the student-respondents. The result of the K to 12 spiral approach proficiency assessment in Mathematics given to the student-respondents, organized in bar graph form, was presented to the teacher-respondents asa starting point in the interview in order to attain the desired data.

When all the questions had been answered by the teacher-respondents, the gathered data was organized and analyzed by the researcher and employedappropriate statistical tools so that desired findings and conclusions

with this study came out. Any response from the student and teacher-respondents were treated with certain degree of confidentiality by the researcher.

Statistical Treatment of Data

The gathered data from the respondents using the questionnaire and interview instrument was organized, tallied, tabulated, analyzed and interpreted using proper statistical measures and procedures.

The following are the statistical tools that were utilized in answering specific questions from the data collected.

Frequency Count and Conversion of Percentage. This was used in the determination of student-respondents' profile in terms of age, sex, grades in Mathematics, their rating score in the proficiency assessment of K to 12 spiral approach as well as the teacher-respondents' response with their profile in terms of educational background, length of service, used learning materials and seminars/trainings attended in K to 12 Mathematics.

Mode. This was employed for the most frequently appearing data for the level of proficiency of the students including their profile and the data perceived by the teacher-respondents in terms of their profile and the common responses they said in the interview and focus group discussion.

Mean and Standard Deviation. This was employed to find the average mean of the data perceived by the teacher and student-respondentsand the summary of scores attained by the students in the administered proficiency test.

Z-test. This statistical tool was used to test the significance between a set of paired variables which is the proficiency level of the Grade 6 and Grade 10 respondents based on the administered assessment.

Pearson Product-Moment Correlation Coefficient. This statistical tool was utilized to determine the relationship between the age, sex and grades in Mathematics of Grades 6 and 10 respondents as well as the relationship between the level of proficiency of the student-respondents and the profile of the teacher-respondents in terms of length of teaching experience and the number of seminars/trainings attended in the K to 12 Program.

Spearman's Rank. This tool was utilized to measure the strength and direction of relationship between two ranked variables such as the proficiency level of the students to and the perceived profile of the teachers in terms of educational background.

Point-biserial Correlation Analysis. This statistical tool was utilized to measure the strength of relationship or co-occurrence between the age-profile of the students and their proficiency level and the association between the used instructional material of the teachers to the proficiency level of the student-respondents.

Finally, hypotheses testing was done using $\alpha=0.05$ & $\alpha = 0.01$ and two-tailed test with the aid of the Excel Tool Analysis Program and SPSS.

Chapter 4

PRESENTATION, ANALYSIS AND INTERPRETATION OF DATA

This sectionpresents the analyses and interpretation of the data collected in this study. It includes the discussion of the questions stated in the first chapter and the research implications of the data gathered.

Profile of the Student-Respondents

Table 3and 4presents the profile of the Grade 6 and Grade 10 students with respect to their age, sex and their grades in Mathematics.

Age and Sex. Table 3and 4 shows the age and sex distribution of the Grade 6 and Grade 10 student-respondents.

Table 3

Age and Sex Distribution of the Grade 6 Student-Respondents

Age (in years)	Sex Category				Total	Percent
	Female		Male			
	f	Percent	F	Percent		
11	8	4.9	2	1.2	10	6.1
12	69	42.3	60	36.8	129	79.1
13	6	3.7	14	8.6	20	12.3
14	1	0.6	3	1.9	4	2.5
Total	**84**	**51.5**	**79**	**48.5**	**163**	**100.0**
Mean	**12.0 yrs**	**-**	**12.23 yrs**	**-**	**12.11 yrs**	**-**
SD	**0.47 yrs**	**-**	**0.55 yrs**	**-**	**0.52 yrs**	**-**

It revealed from the afore-cited table that out of 163 Grade 6 students, majority of them were 12 years old accounting for 69 female studentsand 60 male

students. The mean age of the Grade 6 female students were 12 years old with 0.47year standard deviation while the mean age of the Grade 6 male students were 12.23 years old with the standard deviation of 0.55 year. The overall average age of 163 Grade 6 students was 12.11 years old with 0.52 year standard deviation.

Table 4

Age and Sex Distribution of the Grade 10 Student-Respondents

Age (in years)	Sex Category				Total	Percent
	Female		Male			
	f	Percent	f	Percent		
15	10	3.26	5	1.63	15	4.89
16	152	49.51	79	25.73	231	75.24
17	8	2.61	29	9.45	37	12.05
18	4	1.30	10	3.26	14	4.56
19	0	0.65	3	0.98	3	1.63
20	0	0.00	4	1.30	4	1.30
21	0	0.00	0	0.00	0	0.00
22	0	0.00	1	0.33	1	0.33
Total	**176**	**57.33**	**131**	**42.67**	**307**	**100.0**
Mean	**16.07 yrs**	**-**	**16.57 yrs**	**-**	**16.28 yrs**	**-**
SD	**0.54 yrs**	**-**	**1.10 yrs**	**-**	**0.86 yrs**	**-**

On the other hand, out of 307 Grade 10 students, 231 students have the majority age of 16 years old in which 152 were female and 79 were male. The mean age of Grade 10 female students was 16.07 years old with 0.54 year standard deviation while 16.57 years old was the meanage of Grade 10 male students with 1.10 year standard deviation. The overall mean age of 307 Grade 10 students was 16.28 years old with 0.86 year standard deviation.

The foregoing data signified thatboth Grade 6 and Grade 10 student-respondents were on their right age fitted for the grade level they are enrolled and are dominated by the female sex, a usual observation in every enrolment in almost all educational institution in different levels.

Grades in Mathematics. Table 5 depicts the average Mathematics grades of the student-respondents in 1st and 2nd quarter of their present grade level for the school year 2017–2018.

It can be shown in the table that out of 307 Grade 10 students, there are 114 students whose grades are 80–84 or at the Approaching Proficiency level whereas, 84 of 163 Grade 6 students were at the Proficient level or have grades from 85–89.

Table 5

Student-Respondents' Grades Distribution in Mathematics

Numerical Rating	Descriptive Rating	Grade Level			
		Grade 10		Grade 6	
		f	Percent	f	Percent
<75	Beginning (B)	12	3.91	5	3.1
75-79	Developing (D)	53	17.26	10	6.1
80-84	App. Proficiency (AP)	114	37.13	45	27.6
85-89	Proficient (P)	101	32.91	84	51.5
90 & above	Advanced (A)	27	8.79	19	11.7
Total		**307**	**100.0**	**163**	**100.0**
Mean		**83.0**	**-**	**85.2**	**-**
Interpretation		**AP**	**-**	**P**	**-**
SD		**5.6**	**-**	**3.9**	**-**

Also, the table shows that there are 12 Grade 10 and 5 Grade 6 students whose grade in Mathematics was at the Beginning level or below 75. The fact that they were already on their final year in elementary and Junior High School would mean that they have already attained the needed skill on the subject. From this, 8 teachers out of 37 testified that "these students have poor attendance in class". Some of the high school teachers said that "10 out of these 12 students were retained in their previous and current grade level" while the five remaining Grade 6 students whose proficiency is at beginning level were subjected to remediation to minimize the number of students at this level until the end of school year.Other teachers were conducting home visitation as solution to this concern.

The grade distribution indicates further that majority of the Grade 6 students were more proficient compared to the Grade 10 students whose majority proficiency level appears mostly in the Approaching Proficiency level. It could mean that Grade 6 students, whose significant foundation of learning from Kinder to Grade 6 happens under K to 12 curriculum, has higher grades/proficiency level compared to the Grade 10 students under the same curriculum of K to 12 program but whose prior knowledge, as said by 18 out of 37 teachers, "was from the previous curriculum", the Revised Basic Education Curriculum.

Students' Level of Proficiency Based on the Kto12 Spiral Proficiency Test

Table 6 presents the student-respondents' level of proficiency on the administered spiral proficiency assessment in K to 6 for Grade 6 and K to 10 assessment for Grade 10 respondents.

The proficiency level of Grade 6 and Grade 10 students falls in the category of Beginning level when assessed using the Proficiency Test inthe K to 12 spiral Mathematics. Grade 10 levels appeared to have more Beginning students compared to the Grade 6 level which nearly reached the standard proficiency of the curriculum with 72.9 rating score in the proficiency test. This implies that student's mastery with the concepts in Mathematics was not that deep since they were not able to apply previously learned skills in the conducted assessment.

Table 6

Students' Level of Proficiency Based on the K to 12 Spiral Proficiency Assessment

Numerical Rating	Descriptive Rating	Grade Level			
		Grade 10		Grade 6	
		f	Percent	f	Percent
<75	Beginning (B)	271	88.3	73	44.8
75-79	Developing (D)	6	2.0	25	15.3
80-84	App. Proficiency (AP)	21	6.8	43	26.4
85-89	Proficient (P)	8	2.6	17	10.4
90 & above	Advanced (A)	1	0.3	5	3.1
Total		**307**	**100.0**	**163**	**100.0**
Mean		**57.0**	-	**72.9**	-
Interpretation		**B**	-	**B**	-
SD		**14.9**	-	**13.0**	-

This result according to the responses of the 24 teachers out of 37 that "due to insufficient instructionaltime to deliver/discuss the competencies in the curriculum, they were not able to cover the competencies which appeared in the assessment". Aside from this, classroom disruption, school activities, dead time instruction and weather conditions are some aspects that were mentioned by the teachers in the interview and focus group discussion contributing to insufficiency time for teaching.

The same scenario is true to the study made by Seifert & Beck (2013) that students spend only about half of their time in class actually engaging in learning activities, the rest of the time being expended in classroom procedural matters, transitions, disciplinary matters, dead time, or off-task activities. And through the study of Hayes &Gerhenson (2015:4), they generally found that high-achieving students benefit more from increased instructional time than lower-achieving students. Students who were exposed too much time in instruction significantly gain high achievement results compared to others who experienced fewer exposure of the concepts or discussion.

In addition, 9 secondary teachers claimed that "high school students under the old curriculum were mass promoted",making their students undergo to the policy of the K to 12 curriculum that "No child will be left behind" (NCLB) policy. This is true to the case study made by Mertler (2010) that due to the magnitude of this policy, the pressure on teachers has increased to perhaps

immeasurable proportions. Salient findings revealed that teachers believe NCLB is having negative impacts on instructional and curricular practices, including higher levels of stress related to improving student performance.

Similarly, DepEd were implementing such rule in education and with DepEd Order No. 73 series of 2012 which guides the teachers on how will theypromote or retain a student increases the burden of their work as mentioned by some teachers. This policy made some teachers conduct a summer classes for students who were identified as conditionally promoted in their subject and in order to avoid this, most of the teachers said that "remedial classes would suffice with this issue". Others said that "remediation isn't enough that's why they would recommend that the child must undergo a modular approach". But there are few teachers denied that this kind of approach is ineffective for it only limit the students' understanding with the subject. Thus enabling the teachers in the end to promote their students though this child is not qualified just to lessen the pressure of their task and understand the situation of the child.

In this regard, the proficiency test resulting to too many beginning students indicates that identified factors such as insufficiency instructional time, policy in promoting and retaining a child as responded by teacher-respondents were factors influencing the implementation of spiral Mathematics in K to 12 curriculumbased on the administered assessment.

Comparison between the Proficiency Level of Grade 6 andGrade 10 Student-Respondents Based on the K to 12 Spiral Proficiency Test

Table 7illustrates the difference between the level of proficiency of the 6thand 10th grade respondents based on the administered K to 12 spiral proficiency assessment.

It is viewed in table the result of z-test computation with 0.05 level of significance and a degree of freedom between two groups resulting to the computed z-value of 44.47 which is greater than the critical z-value of 1.96 leading to the rejection of the null hypothesis.

This indicates that Grade 6 students performed better than Grade 10 students. This revelation is somehow true based on the findings of Logerfo et al (2007) that with the elementary and secondary reading and mathematics skills and achievement results when compared and studied together enables the researcher to get a very complete picture on how curriculum gaps evolve over the course of early elementary and high school years and how these trajectories differ from time to time as elementary students moved to secondary level. The two curriculum vary from one another and students' performance was affected due to continuous utilization of the old one.

It revealed in the focus group discussion about teachers' viewpoint on the old curriculum in which Junior high school students from Grade 7 including the respondents in this study, the Grade 10, "has poor prior knowledge of the old curriculum making them unable to used learned skills" as mentioned by 5 high

school teachers. K to 12 curriculum whose approach in teaching is spiral which was introduced to the Grade 6 students differed from the Revised Education Curriculum approach where the lower Math must be discussed first before proceeding higher Mathematics. This point of view of 7 teachers was predicted by most teachers as narrow reasoning. According to them, "how a student takes his or her studies, greatly determines his/her level of academic achievements", as concluded by most teachers in the interview and FGD. The level of preparation and learning strategies developed and employed consciously by students, go a long way to influence their level of academic performance.

Table 7

Comparison Between the Proficiency Level of Grade 6 and Grade 10 Student-Respondents Based on the K to 12 Spiral Proficiency Test

Parameter	Grade Level	
	Grade 6	*Grade 10*
Mean	72.93	57.00
Standard Deviation	13.00	14.92
Observations	163	307
z-value	44.47	
P(Z<=z) two-tailed	0.000	
z Critical two-tailed	1.96	
$\alpha = 0.05$	*Evaluation/Decision: Reject Ho*	

Thus, study habit is one of the greatest aspects or learning factors that hugely influences students' academic achievements. If undermined by students at all levels, teachers, administrators, parents and guardians, school counselors

and the government, then, the trend and menace of students' abysmal performance in both internal and external examinations would continue to boom and become more devastating and alarming (Arul, 2014:145).

Additionally, Ujo&Olofu (2016:587-588) recommended in their study that teachers and school guidance counselors should collaboratively guide students on how to develop good study habits which seems to be an important determinant of academic performance. As responded by most teachers in the FGD that 16 out of 37 were doing remedial classes on teachers' available time just to ensure that some low performing students wouldn't be left behind in the discussion.

Moreover, it was also raised in the focus group discussion that the participation of the parents affects student's achievement. During the FGD, teachers said that "some parents do not give much attention on their students' progress and don't even know that their children is not attending some classes".As believed by all teachers that parents have an important role in identifying children's talent and through proper guidance and mutual understanding, students' performance would improve. Same is true to the research study made by Mehrafza (2005) that motivations of educational achievement of elementary and high school students are sharpening with their family characteristics.

It is recommended in the study of (Mutodi&Ngirande, 2014:288), that parents should also set realistic expectations on their children's performance.

These high expectations motivate their child to perform well in mathematics. The confidence they have in their children builds their own confidence in their academic abilities and makes them more likely to succeed.

Parents should take a leading in supporting their children's educational endeavours. "A strong parent-teacher partnership for students must be done to help the student excel in mathematics" as said by 10 teachers in the interviewbecause students spends most of their time in school and teachers knew that with parents active involvement in supervising their child's learning progress.

Targeting the standards, however, is one of the most significant high point in the K to 12 curriculum. For mathematics, Opfer et al (2013) stated that there are some evidence suggests that teachers are not prepared to help students meet those standards since they were confused with the new spiral approach in teaching K to 12 curriculum. Students who perform poorly in arithmetic are subject to a special form of the spiral curriculum, which might be termed the circular curriculum. They repeat arithmetic over and over until they stop studying math (Gamoran, 2001: 138).

With the additional above-mentioned factors, it can be inferred that Grade 10 students' poor performance in the old curriculum, study habit of the student-respondents and targeted standards of the school were some standpoint of the teachers in the implementation of the spiral curriculum.

Although this factors exist butother than that,ifspiral approach of K to 12 was practiced or stressed religiouslyin the elementarylevel, the performance of the students in the high school level will improve since mastery of skills gained in elementary would result to progressive improvement in high school.

Profile of the Teacher-Respondents

It is described in Table 8 to 11the profile of the mathematics teachers both in elementary and secondary level.

Displayed in Table 8 was the educational background of the teacher-respondents. Majority of themclaimed to have units in their Master's degree. As perceived by 29 teacher-respondents, nowadays, they continuously enhance their skills in teaching by studying a degree program which help them to be more efficient and to grow professionally in their career especially for the four teacherswho responded that their specialization is not math.

Table 8

Educational Background of the Teacher-Respondents

Profile	f	Percent
Master's Degree Holder	5	13.5
w/ MA/MS/ units	24	64.9
Bachelor's Degree Holder	8	21.6
Total	**37**	**100.0**

Length of Service.In terms of length of service in teaching as revealed in Table 9 that out of 37 teachers, 9 or 24.3 percent of them responded to have 5–9

years of the length of service with a mean average length of service of the teacher-participants for 12.41 years with the standard deviation of 8.42 years.

Table 9

Length of Service of the Teacher-Respondents

Profile	f	Percent
0-4	8	21.6
5-9	9	24.3
10-14	5	13.5
15-19	7	18.9
20-24	3	8.1
25-29	5	13.5
Total	**37**	**100.0**
Mean	**12.41 yrs**	
SD	**8.42 yrs**	

The number of seminars/trainings attended in the K to 12 programwas presented in Table 10. As responded by 37 teachers, it shows that majority of the teacher-respondents said that they have attended 3–7 trainings.The mean average of the seminars/trainings attended by the teachers are 5 trainings with the standard deviation of 3 trainings. The modal seminars/trainings attended by the teachers so far are those 5-day trainings given by DepEd relative to the implementation of K to 12 spiral instruction itself as perceived by the teacher-respondents.

Table 10

Seminars/Trainings Attended by the Teacher-Respondents

Profile	f	Percent
3-7 trainings	32	86.5
more than 7 trainings	5	13.5
Total	**37**	**100.0**
Mean	**5 trainings**	
SD	**3 trainings**	

In terms of the used instructional materials as depicted in Table 11, 13 or 35.1 percent responded that the teachers are utilizing a non-Kto12 learning material because of unavailability of the K to 12 textbooks or late issuance of DepEd in the delivery of learning materials as revealed in the focus group discussion. The remaining 24 or 64.9 percent makes use of the K to 12 instructional materials. These K to 12 and non-Kto12 instructional materials guide the teacher on the lessons to be covered or teaching aids to be used for the entire year.

Table 11

Used Instructional Materials of the Teacher-Respondents

Profile	f	Percent
Non-Kto12	13	35.1
K to 12	24	64.9
Total	**37**	**100.0**

Legend: Non-Kto12 IM – Books from RBEC (previous curriculum), IMs not related to K to 12
Kto12 IM – K to 12 Books (aligned with K to 12 curriculum)

However, these non-Kto12 learning materials as replacement would not guarantee that it could complement the demands of the new K to 12 curriculum. The mere fact that these teachers are utilizing old books from the previous curriculum could affect the operational success of the K to 12 spiral approach since sequencing of the topics of the old curriculum doesn't matter compared to the present curriculum.

Relationship Between Student-Respondents' Level of Proficiency and their Profile

Table 12specifically presents the result of correlation analysis between the proficiency level of the student-respondents and their profile in terms of age, sex and their grades in Mathematics.

The result between the correlated analysis between the proficiency level of the student-respondents and their profile in terms of sex and grades in Mathematics were not significantly connected as revealed in the obtained r value which was less than the p-value leading to the acceptance of the null hypothesis.

It could be concluded that grades in Math and sex-profile of the student-respondents has no connection with the proficiency level of the students in the administered assessment in spiral math. This result was somewhat true to some reactions of the teachers that students' gender and grades had nothing to do with their proficiency level.

However, when the age-profile of the student respondents was correlated to their obtained proficiency level, it revealed to have a significant relationship based on the obtained r-value of 0.245 greater than 0.000 p-value. This led to the rejection of the null hypothesis.

Hence, this indicates further that under K to 12 curriculum, proficiency level ability of the student in spiral Mathematics is affected by the age-profile of the student-respondents. This meant that as students' age increases proficiency level of the child is maintained or increases with this manner. Spiral curriculum

approach in this case is effective as believed by Quijano et al (2012) which allows the learner to acquire knowledge and skills suitable to their developmental and cognitive stages. It strengthen retention and mastery of the previous topics as they are revisited with increasing depth and complexity of learning.

Table 12

Relationship Between Student-Respondents' Level of Proficiency and their Profile

Grade Level	Profile	Correlation	Proficiency Level
Grade 10	Age	Pearson Correlation	-.096
		Sig. (2-tailed)	.093
	Sex	Pearson Correlation	-.165(**)
		Sig. (2-tailed)	.004
	Grade	Pearson Correlation	.504(**)
		Sig. (2-tailed)	.000
Grade 6	Age	Pearson Correlation	.158(*)
		Sig. (2-tailed)	.045
	Sex	Pearson Correlation	.124
		Sig. (2-tailed)	.114
	Grade	Pearson Correlation	.001
		Sig. (2-tailed)	.988
Combined Grade Level	Sex	Pearson Correlation	.000
		Sig. (2-tailed)	.998
	Age	Pearson Correlation	**.245(**)**
		Sig. (2-tailed)	**.000**
	Grade	Pearson Correlation	-.088
		Sig. (2-tailed)	.058

** Correlation is significant at the 0.01 level (2-tailed).
* Correlation is significant at the 0.05 level (2-tailed).

So, if the foundation of learning in elementary under K to 12 spiral approach is said have a positive effect on the performance of the students in

Mathematics, then secondary schools will end up producing effective high school graduates.

Relationship Between Student-Respondents' Level of Proficiency and their Teacher's Profile

Table 13 shows the result of correlation between the level of proficiency of the student-respondents and the profile of the teacher-respondents in terms of educational background, number of trainings/seminars attended, length of service in teaching and used instructional materials.

Among the four collected profiles from the teacher-respondents, used instructional materials was discovered to have a significant correlation in students' proficiency level compared to the other profiles of the teachers. This means that selection of instructional to be used in class instruction influenced students' achievement in Mathematics.

Twenty-five teachers pinpointed that "the insufficiency of learning materials, most especially for the students" during the interview and focus group discussion affects the effective implementation of K to 12 spiral approach. They attributed such predicament to lack of government's sincere and strong stance over prioritization of funding for learning materials which hindered the effective and immediate release of funds and other resources intended for the development and reproduction of learning materials.

Table 13

Relationship Between Student-Respondents' Level of Proficiency and theirTeacher's Profile

Grade Level	Teacher's Profile		Student's ProficiencyLevel
Grade 6	Educational Attainment	Correlation Coefficient	-.016
		Sig. (2-tailed)	.941
		N	25
	Length of Service	Pearson Correlation	-.428(*)
		Sig. (2-tailed)	.033
		N	25
	No. of Seminar/Trainings Attended	Pearson Correlation	.092
		Sig. (2-tailed)	.663
		N	25
	Instructional Materials Used	Pearson Correlation	-.056
		Sig. (2-tailed)	.792
		N	25
Grade 10	Educational Attainment	Correlation Coefficient	-.206
		Sig. (2-tailed)	.520
		N	12
	Length of Service	Pearson Correlation	-.440
		Sig. (2-tailed)	.153
		N	12
	No. of Seminar/Trainings Attended	Pearson Correlation	-.072
		Sig. (2-tailed)	.823
		N	12
	Instructional Materials Used	Pearson Correlation	-.031
		Sig. (2-tailed)	.925
		N	12
Combined Grade Level	Educational Attainment	Correlation Coefficient	.209
		Sig. (2-tailed)	.213
		N	37
	Length of Service	Pearson Correlation	.253
		Sig. (2-tailed)	.130
		N	37
	No. of Seminar/Trainings Attended	Pearson Correlation	.067
		Sig. (2-tailed)	.692
		N	37
	Instructional Materials Used	Pearson Correlation	**-.436(**)**
		Sig. (2-tailed)	**.007**
		N	37

** Correlation is significant at the 0.01 level (2-tailed).

* Correlation is significant at the 0.01 level (2-tailed).

As said by 10 teachers who attended the training, "the materials distributed on the K to 12 5-day trainings are not even complete". In lined with this, it will be difficult to teach without a reference material in the new curriculum even though there is an existing curriculum guide but still instruction must have been better if there were accessible materials to be used.

According to the findings of the study of Voltz et al (2010:19), learning materials suggested in the curriculum and activities recommended had a huge impact on educationespecially in diverse and inclusive classrooms where students' skill levels, learning styles, and interests are more varied. As Lenon (2015) said on his observation in his case study that, typically,there are many schools nationwide where three or more pupils share a single textbook or even in worse cases, the teacher is the only one who have a textbook.

Thus,the teachers initiated and tried to fill this gap like spending their own personal resources in photocopying of this K to 12 materials or used available ones.To cope with the pressing demand for more materials, 22 out of 37 teachers in the FGD said that "they are the one providing the instructional materials by utilizing their personal finances or makes use of a non-Kto12 learning material"while 6 teachers responded that "they are funded by their school administrators in reproduction/photocopying of the instructional materials" and the remaining 9 teachers "kept on borrowing these materials from his/her co-teachers" as responded by them.

This may imply also that after the teachers have realized that the materials being supplied by DepEd was insufficient vis-à-vis the need, they started making a move to provide their own learning material suited to the needs of their students. And by this, performance of the students in Mathematics is affected based on the quantitative result in the proficiency test assessing proficiency level of the student-respondents because of varied usage of instructional materials especially if it is known to be a non-Kto12 learning material.

As previously mentioned, profile of the teachers in terms of the educational background, length in service, or even if the teachers attended or not a training, progress in proficiency level of the students don't matter. This result is somehow true to the findings of Buddin&Zamarro (2009) that student achievement is unaffected by whether classroom teachers have advanced degrees. It increases however with teachers' experience, but the linkage is weak and largely reflects poor outcomes for teachers during their first year or two in the classroom.

However, the findings in this study negates the study made by Subedi (2015:11-13) that teacher training has contributed to improve teacher-student relations, students are more actively involved in learning. There is an apparent increase in the students' motivation to learn and succeed. Varieties of teaching methods are used by trained teachers and better results are achieved due to improved objectivity in assessments.

During the focus group discussion, "follow up supervision is not practice after the workshop/training" as responded by some teachers and some says that "trainings were just for compliance of the activities in DepEd". Thus, the suggested instruction imparted to the teachers by the trainer in implementing such kind of teaching methodology is not applied and 9 teachers even answered that "they do feel more comfortable with their own style of teaching than adapting the new approach suggested by DepEd for makes their students be more confused with the discussion".

However, Will (2016) stressed that the aftermath action of the trainings is the most crucial for it will determine if the teachers are applying what they learned from the training. Majority of training offered to teachers in the K to 12 curriculum-80 percent to be exact-doesn't align with the high-quality professional learning it would give in return to the learning progress of the students. Supervision on the training doesn't happen and what makes it worse is that after attending, the teacher goes back to his/her usual style of teaching, the traditional one.

If those were some of the basis on how teachers utilized the curriculum, then they are mispracticing the spiral approach in teaching K to 12 Mathematics. That is why, there aresome negative responses made by the teachers which jibed to the proficiency assessment result that majority of the students were at Beginninglevel.

Operational Efficiency of Spiral Mathematics in the K to 12 Curriculum and Its Implication

The following viewpoint were derived based from the analyses of data: First, the implementation of K to 12 spiral Mathematics appeared to be effective based on the significant difference result of the Proficiency test administered between Grade 6 and Grade 10 students. Although, variation of the test differs from one another but the fact that those competencies appeared in the assessment are competencies which was aligned in the curriculum guide and being followed by the teacher-respondents based on their responses in the interview and focus group discussion, isn't enough to boost students' achievement in Mathematics because some existing factorswere practiced by most teachers.Also, thisimplies that Grade 10 students' prior knowledge, under Revised Basic Education Curriculum was not sufficient to attain the targeted standards of the new curriculum unlike Grade 6 students whose proficiency level was almost near the rating standards of the K to 12 curriculum. If these practices will be avoided, positive impact towards students' achievement will transpire.

Second, RA 10533 known as "Education Act of 2013" puts special premium on education and accords it with the highest budgetary priority and explicitly provides and clearly mandates the state to "assign the highest budgetary priority for education." If the government would only give its fullest support and provide the learning materials to every school, the curriculum could produce proficient students. And by these, thedemand of the curriculum to

produce globally competitive graduates will happen and Filipino students will be recognized as effective with this new implemented K to 12 curriculum having spiral technique as its approach to teaching.

Finally, the implementation of K to 12 spiral approach in Mathematics was effective based on the age-profile of the student-respondents when correlated to its proficiency level. This means that when a student successfully attained the pre-requisite skills in the previous level, this gained knowledge will be very much useful in students' present grade level. Thus, when the child is promoted, attainment of learning increases, also with the age of the student. This also signifies that as the students get older, teachers presenting more details increasing complexity and depth of the competencies in the curriculum will be achieved.There is now the so-called vertical articulation of competencies in Mathematics from the first grade of elementary to the last grade of junior high school in K to 12 spiral approach.

Chapter 5

SUMMARY OF FINDINGS, CONCLUSIONS AND RECOMMENDATIONS

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

Summary of Findings

The following were the major findings derived from the study.

1. The mean age of the Grade 6 respondents was 12.11 years old with standard deviation of 0.52 year while the mean age of the Grade 10 students was 16.28 years old with 0.86 year standard deviation.

2. Both elementary and secondary students were dominated by female sex accounting for 84out of 163 or 51.5 percent for Grade 6 and 176 out of 307 or 57.33 percent for Grade 10.

3. The mean average grade in Mathematics of Grade 6 students is 85.2 or at the Proficient level with a standard deviation of 3.9 while Grade 10 students obtained a mean average grade of 83.0 which is at the Approaching Proficiency level with 5.6 standard deviation.

4. Among the twelve Grade 10 students whose grade in Mathematics were at the Beginning level or below 75, 10 of them were retained in their previous and current grade level while the remaining two Grade 10 students and

five Grade 6 students were retained because of poor attendance in class as responded by the teacher-respondents.

5. Majority of the Grade 6 and Grade 10 students are in the Beginning level based on the administered spiral proficiency test in Mathematics accounting for 271 or 88.3 percent were Grade 10 students and 73 or 44.8 percent were from Grade 6 respondents. Moreover, the mean rating score of Grade 10 is 57.0 with 14.9 standard deviation while the mean rating score of the Grade 6 is 72.9 with 13.0 standard deviation.

6. The comparison between the proficiency level of Grade 6 and Grade 10 students showed a significant difference at 0.05 level of significance and a degree of freedom between the two groups with the computed z-value of 44.47 higher than the critical z-value of 1.96. The null hypothesis stating"there is no significant difference between the proficiency level of Grade 6 and Grade 10 respondents based on the administered assessment" was rejected.

7. Out of 37 teachers from elementary and secondary, majority of them claimed to have units in their Master's degree accounting to 24 teachers or 64.9 percent.

8. Nine out of 37 teachers from elementary and secondary or 24.3 percent responded to have a 5–9 years length of teaching service with a mean average length of service of the teacher-participants for 12.41 years and 8.42 years standard deviation.

9. As perceived by the teacher-respondents, the modal number of seminars/trainings provided by the government and was attended by the teacher-respondents is 3-7 trainings with a mean value of 5 trainings and 3 trainings standard deviation.

10. The most frequently used instructional materials as responded by 24 teachers or 64.9 percent in the elementary and secondary level are the K to 12 learning materials as suggested by DepEd. Due to unavailability of these instructional materials, 13 teachers or 35.1 percent makes use of the previous textbook of RBEC curriculum as replacement to this insufficiency.

11. In associating the proficiency level of the student-respondents with their perceived profile in terms of sex and grades in Mathematics in the first two quarter for the school year 2017-2018, the r-values with respect to its p-values was found to be insignificant correlation. Thus the null hypothesis "There is no significant relationship between theprofile of the student-respondents in terms of sex and grades in math and their proficiency level" was accepted.

12. In associating the proficiency level of the student-respondents with their age-profile, the correlation of 0.245 r-values with 0.000 p-values turned to have significant connectionat 0.01 level of significance of the two compared groups. This led to the rejection of the null hypothesis stating "there is no significant relationship between the student's profile and their assessment result in terms of age-profile".

13. In associating the proficiency level of the student-respondents and the responded profile of the teacher-respondents in terms of their educational background, length of service in teaching and the number of trainings/seminars attended in the implementation of K to 12 program, the coefficient of correlation in r-values with p-values discovered to have a negligible correlation.

14. In associating the proficiency level of the student-respondents and the responded profile of the teacher-respondents in terms of the used instructional materials, turned to have a significant correlation. Thus the null hypothesis stating "There is no significant relationship between the level of proficiency of the student-respondents and the profile of the teacher-respondents in terms of used instructional materials" was rejected.

15. In terms of teacher's perspective on the implementation of the K to 12 spiral Mathematics, insufficiency of K to 12 instructional materials is the most common factor that hindered the efficiency implementation of K to 12 spiral curriculum. 25 teachers out of 37 responded that unavailability of K to 12 materials made other teachers to make use of the previous books in the Revised Basic Education Curriculum (RBEC) or even provide their own copy to address this gap.

16. In terms of teacher's perspective on the implementation of the K to 12 spiral Mathematics, insufficiency of instructional time was raised by 24 out of 37 teachers. Too much competencies to be tackled for the entire year isn't enough for one-hour session considering the prior knowledge of some students ending

up with repetition of the lesson which was forgotten by the students or was not even discussed either by their Mathematics teachers caused by the following factors such as absenteeism, tardiness, classroom disruption, school activities, dead time, and due to weather conditions.

17. In terms of policy in promoting and retaining a student which was said as one of the teacher's perspective on the implementation of the K to 12 spiral Mathematics,16 teachers out of 37 were utilizing a remediation after classes to avoid students' retention and taking summer classes. Some responded that they are promoting students to lessen the stress and their beliefs that somebody students' dream they wanted to be will be fulfilled.

18. In terms of teacher's perspective on the implementation of the K to 12 spiral Mathematics regarding their trainings/seminars, 20 out of 37 teachers believed that the trainings provided by DepEd is not related to K to 12 and said further that an evaluation/assessment must be done after the training implementation to find out if the teachers were applying the instruction suggested in the training and to know if there is an effect to classroom setting.

19. In terms of teacher's perspective on the implementation of the K to 12 spiral Mathematics, insufficiency of teachers handling Math subject was also raised mostly by elementary teachers and only by 3 out of 12 secondary teachers. As a solution, enrolling a graduate course refreshes the teachers to improve their teaching way of teaching especially for the 3 non-major in Mathematics.

20. In terms of teacher's perspective on the implementation of the K to 12 spiral Mathematics, involvement of the parents also affects the learning development of the students. More or less than 34 teachers said that proper guidance and mutual understanding of the parents towards their child would improve the performance of the students.

21. In terms of teacher's perspective on the implementation of the K to 12 spiral Mathematics, study habit of the students determines his/her level of academic achievements as concluded by almost30teachers. These learning factor on the implementation of K to 12 spiral approach has a great impact towards students' achievement.

22. Targeting the standards of the curriculum as one of teacher's perspective on the implementation of the K to 12 spiral Mathematics was also revealed. Teachers are not prepared to help students meet those standards since they were also confused with the new spiral approach used in teaching K to 12 Mathematics. According to almost 34 teachers as long as they follow the underlying principles in teaching and continue to do their task as a teacher, K to 12 curriculum will be worked out effectively.

Conclusions

From the findings of the study, the following conclusions were drawn:

1. The student-respondents were on their right age fitted for the grade level they are enrolled and are dominated by the female sex, a usual observation

in every enrolment in almost all educational institution in Grade 6 and Grade 10 levels.

2. Student-respondents' profile in terms of the average grades in Mathematics for the first and second quarter revealed that Grade 6 students having an average mean of 85.2 performed better than Grade 10 students whose average mean is 83.0. Majority of Grade 6 students' proficiently level were Proficient (P) while majority of the Grade 10 students were at the Approaching Proficiency (AP) level.

3. The proficiency level of both Grade 6 and Grade 10 students falls in the category of Beginning level when assessed using the Proficiency Test. Grade 10 level appeared to have more Beginning students based on the obtained 57.0 average mean than the Grade 6 level which nearly reached the standard proficiency of the curriculum with 72.9 average rating score in the proficiency test. If spiral approach of K to 12 was practiced or stressed religiously in the elementary level, the performance of the students in the high school level will improve since mastery of skills gained in elementary would result to progressive improvement in high school.

4. Teachers nowadays, continuously enhance their skills in teaching by studying a degree program which helps them to be more efficient and to grow professionally in their career especially for some whose specialization is not math.

5. As perceived by the 37 teachers, the average length of service in teaching of the elementary and secondary teachersare 12.41 years with the standard deviation of 8.42 years.

6. The modal seminars/trainings attended by the teachers so far are those 5-day trainings given by DepEd not related to Mathematics subject itself as perceived by the teacher-respondents.

7. K to 12 and non-Kto12 instructional materials guide the teacher on the lessons to be covered or teaching aids to be used for the entire year. But, K to 12 instructional materials as recommended by DepEd revealed to have a positive impact in the initial attainment of high proficiency level based administered proficiency test compared to non-Kto12 learning material which affects the effective implementation of K to 12 spiral approach in teaching Mathematics..

8. A teacher whose specialization is Math in their Baccalaureate degree or a non-math major, has enough or few years of experience in teaching Mathematics or even attended numerous trainings/seminars in the K to 12 curriculum as perceived by them has no effect at all in the proficiency level of the student-respondents based on the administered spiral assessment in K to 12 Mathematics.

9. Used instructional materials when correlated to students' proficiency level revealed to have a significant connection. Selection of instructional materials suited to the learning needs of the students suggested even in the seminar affects the learning progress of the child especially if wasn't

aligned with the recommended learning competencies and activities of the K to 12 spiral approach.

10. Insufficiency of instructional materials to be utilized by the teacher-respondents was due to inadequate support given by the government leading to teachers' initiative to provide their own and which affects the attainment of high proficiency level result.

11. Students who were exposed too much time in instruction significantly gain high achievement results compared to others who experienced fewer exposure of the concepts or discussion in the implementation of the new curriculum. Time allotment for the discussion of all the competencies in the curriculum is not enough to be covered for the entire year and teachers were conducting remediation to resolve the policy on promoting and retaining a student.

12. A strong parent-teacher partnershiphelps students to practice a good study habit which help students to engage actively in developing their potentials during Math classes.

Recommendations

Based on the conclusions drawn from the findings of the study, the researcher recommends the following:

1. Mass promotion which was the primary root cause of deteriorating achievement result in the Philippine educational system based from teachers'

perspective must be prevented for it will continuously producepoor performing studentsboth in elementary and secondary level.

2. As far as the proficiency level of the students is concern, Mathematics teacher should try to evaluate their students by conducting an achievement proficiency test for new incoming Grade 7 students assessing their elementary-mathematical skills to find out their competency and understanding in elementary Mathematics.

3. In the absence of some instructional tool aided to teaching, the teachers could try seeking help from the local government unit (LGU) for any funding support they could provide on the reproduction/photocopying of some instructional materials in Mathematics.

4. The K to 12 Mathematics curriculum guide and other learning materials should be revised ensuring the effective flow and operation of spiral approach that would serve as an avenue in enhancing the performance of elementary and secondary students.

5. A compilation or more suggested mathematical activities should be made in revising the learning materials following the competency-based standards in the K to 12 curriculum.

6. DepEd should conduct mathematical trainings, seminars and workshops relative to the development of instruction in spiral technique used in teaching the subject and for the teachers to be more updated to the recent trends in teaching. Also, the DepEd personnel or the Mathematics supervisor must

evaluate the effectiveness of such trainingor it if is even followed/appliedby the teachers as new approach in classroom setting.

7. Another study should be conducted to other subjectareas to evaluate the effectiveness of K to 12 spiral approach. It is suggested also to try this study to other division or even in private schools to determine other factors that must be considered in enhancing the K to 12 spiral approach.

BIBLIOGRAPHY

Abueva, Cianeko. Why Does the Philippines Need the K-12 Education System? https://soapboxie.com/social-issues/The-Implementation-o-the-K-12-Program-in-the-Philippine-Basic-Education-Curriculum.

Alonzo, Rosario I. (2015) "Understanding the K to 12 Educational Reform". *Journal of Philippine Social Sciences Review (PSSR)* Vol . 67.

Altares, Priscilla S. et al., *Elementary Statistics with Computer Applications.* Rex Book Store, Inc. Manila, Philippines. 2005. ISBN 971-23-4300-6.

Arciaga, Violeta N. (Ph.D.) et al., ABC-Teach Model in the 21st Century Skills of Secondary Biology Teachers. *International Journal of Science and Research.* Volume 5 Issue 5. ISSN (Online): 2319-7064. May 2016.

Argote, Aubrey B. "*Spiral Progression Approach: The Phenomenological Plight of Science Teachers*". A Master's Thesis in St. Mary's College of Tagum, Inc. Tagum City. March 2016.

Arul, Lawrence A. "Relationship between Study Habits and Academic Achievement of Higher Secondary School Students" *Indian Journal of Applied Research* Volume: 4 Issue: 6 ISSN- 2249-555X June 2014.

Asaad, Abubakar S. & Hailaya, William M. *Measurement & Evaluation Concepts & Principle,* Rex Book Store (2004).

Beal, Vangie (2014). "*Operational Efficiency Meani*ng" Retrieved February 27, 2018 https://www.webopedia.com/TERM/O/operational_effieciency.html

Buddin, Richard & Zamarro, Gema "Teacher Qualifications and Student Achievement in Urban Elementary Schools" Retrieved February 26, 2018 from https://www.rand.org/content/dam/rand/pubs/reprints/2010/RAND_RP1410.pdf

Cabansag Marie Grace S. (2014). "Impact Statement on the K-12 Science Program in the Enhanced Basic Education Curriculum in Provincial Schools". *International Referred Research Journal* Vol. V, Issue-2, April 2014 E-ISSN 2229-4686/ ISSN 2231-4172.

Callanta, Melvin M. et al., *Mathematics- Grade 10 Learner's Module-Department of Education First Edition.* Rex Book Store, Inc. Pasig City, Philippines. 2015.

Caspe, Mitos B. "Implemenation of Grade 7 Science Curriculum in the K to 12 Program in District I of Eastern Samar Division". Master's Thesis. Eastern Visayas State University. Tacloban City. March 2016.

Chua, Matthew D. "Implementation Status of the K to 12 Grade One Basic Education Curriculum in Tacloban City Division". Master's Thesis. Leyte Normal University. Tacloban City. June 2016.

Collins, D. (2014) Definition of Efficiency Retrieved March 9, 2018 from https://www.collinsdictionary.com/dictionary/english/proficiency-test.

Conception, Benjamin Jr. et al. *Licensure Examination for Teachers NCBTS Oriented 2015 Edition.* MET Reviewer Publishing House, Manila, Philippines. 2015. ISBN: 978-971-9908-14-2

Corpuz, Brenda B. "*The Spiral Progression Approach in the K to 12 Curriculum*". Retrieved http://pacu.org.ph/wp2/wp-content/uploads/2014/07/The-Spiral-Progression-Approach-in-K-to-12-Dr-Brenda-Corpuz.pdf

Davis, Edith G. "*A Study of the Effects of Experimental Spiral Physics Curriculum Taught to Sixth Grade Girls and Boys*". A Dissertation in Baylor University. December 2007.

De Dios, Angel (2013). *Spiral curriculum: When and how? Redundant versus Progressive?* http://philippinesbasiceducation.us/2013/05/spiral-curriculum-when-and-how.html

De Los Reyes. Elizer Jay Y. "*The Filipino in Obsolescence: Citizenship and Educational Policy Reform in the Philippines*". Master's Thesis University of Illinois at Urbana-Champaign. Urbana, Illinois. 2014.

De Guzman, Sara S. (2014). *The Irony of DepEd – The Philippine Star* Retrieved March 31, 2014 from http://www.philstar.com/opinion/2014/03/31/1307049/irony-deped

Del Rosario, Rubyy T. "*The Benefits of K+ 12 Basic Education Program*". The Modern Teacher-June 2014 Issue-Vol. 63, No. 01., p. 15-16. In the Grade School, Inc., ISSN 2094-8042.

DepEd Order No. 31 series of 2012 Policy Guidelines on the Implementation of Grades 1 to 10 of the K to 12 Basic Education Curriculum (BEC) Effective School Year 2012-2013 http://www.deped.gov.ph/sites/default/files/order/2013/DO_s2013_031.pdf

DepEd Order No. 73 series of 2012 "Guidelines on the Assessment and Rating of Learning Outcomes Under the K to 12 Basic Education Curriculum"

Ellar, Alfred James "Philippine K-12 System in the Post-modern Educational Landscape". *BAYBAYIN* Vol. 1. ISSN 1908-4697. August 2015.

Ferreol, Michelle Denise L. "*Form Policy to Practice: An Analysis of the Factors Affecting Ground-level Execution of the K to 12 Basic Education Program in the Philippines*" A Thesis in The Harvard University Department of Sociology. Cambridge, Massachusetts. March 2015.

Geronimo, Jee Y. *(June 24, 2016) K to 12 and Beyond: A Look Back at Aquino's 10-point Education Agenda* https://www.rappler.com/nation/137492-look-back-aquino-10-point-education-agenda

Gershenson, Seth (2015) *Impact of instructional time not equal across stude*nts Retrieved February 27, 2018 from https://www.brookings.edu/blog/brown-center-chalkboard/2015/09/24/impact-of-instructional-time-not-equal-across-students/

Ginsburg, David (2012). *Spiraled Instruction Stifled Learning. Education Week Te*acher http://blogs.edweek.org/teachers/coach_gs_teaching_tips/2012/03/spiraled_instruction_stifled_learning.html

Greaney, Vincent & Kellaghan, Thomas "Assessing National Achievement Levels in education" *Library of Congress Cataloging-in-Publication Data,* Volume 1, ISBN-13: 978-0-8213-7258-6 Washington, DC. April 11, 2017.

Harden, R.M. & Stamper, N. (2009) *What is a Spiral Curriculum?* Medical Teacher Vol. 21. No. 2, p. 141. http://www.tandfonline.com/doi/abs/10.1080/01421599979752?journalCode=imte20

Hegina, Aries Joseph (2015) *"DepEd: 16 M outdated books not fit for K to 12 still useful"* Retrieved February 28, 2017 from http://newsinfo.inquirer.net/683838/deped-16-m-outdated-books-not-fit-for-k-to-12-still-useful

Howard, Johnston (2012) *The Spiral Curriculum: Research into Practice* Retrieved September 10, 2017 from https://eric/ed/gov/?id=ED538282

Jacob, Brian A. & Lars, Lefgren 2009. "The Effect of the Grade Retention on High School Completion." *American Economic Journal: Applied Economics,* Volume 1 Issue 3: p. 33-58. DOI: 10.1257/app.1.3.33.

Kitao, Kemji et al "Selecting and Developing Teaching/Learning Materials" *The Interest TESL Journal,* Vol. IV, No. 4, April 1997

Lacorte, Emelita A. "*Readiness of the Implementation of K to 12 Program in selected Private and Public Schools in Quezon.*" A Master's Thesis in Polytechnic University of the Philippines- Open. Lipa City, Philippines. 2014.

Legarse, Ma. Linda S. "*Proficiency of Grade 7 English Teachers and Their Readiness for the Implementation of the K to 12 Curriculum*". A Dissertation in Samar State Univeristy, Catbalogan City. March 2015.

Legaspi, Amita "*Lack of materials, facilities still hound K to 12 implementation*". GMANews Retrieved from http://www.gmanetwork.com/news/news/specialreports/363734/lack-of-materials-facilities-still-hound-k-to-12-implementation/story/

Logerfo, Laura et al., "*Gender Gaps in Math and Reading Gains During Elementary and High School by Race and Ethnicity, 2007.*

Magnuson, Katherine P. "Maternal Education and Children's Academic Achievement During Middle Childhood". *Developmental Psych*ology 43:2007. P. 1497.

Martinez, Hazel, et al. (2014) "Perceived Stress of Teachers Implementing K-12 in Arellano University-Main and Ramon Magsaysay (Cubao) High School" *College of Arts and Sciences Research Journal* Vol. 5 No. 1 Kite E-Learning Solution, Inc. ISSN 2094-7895 Retrieved April 2, 2017 from http://ejournals.ph/article/php?id=1917

Masayon, Natividad A. *"Implementation of Basic Education Curriculum as Perceived by Teachers and School Administrators in Balangiga District"*. Master's Thesis. Leyte Institute of Technology. Tacloban City. January 2004.

Mertler, Craig, A. (2011) "Teacher' Perceptions of the Influence of No Child Left Behind On Classroom Practices" *Current Issues in Education Journal* Vol. 14 No. 1 ISSN 1099-839X

Moles, David (2015) "Student perceptions of a spiral curriculum" *European Journal Of Dental Education.* DOI: 10.1111/eje.12156 Retrieved April 2, 2017 from https://www.researchgate.net/publication/279067249_Student_perceptions_of_a_spiral_curriculum

Mullis, Ina V. et al., "TIMSS 2015 International Results in Mathematics". *TIMSS & PIRLS-International Study Center*

Mutodi, Paul & Ngirande, Hlanganipai "The Impact of Parental Involvment on Student Performance: A Case Study of a South African Secondary School" *Mediterranean Journal of Social Sciences MCSER* Publishing, Rome-Italy. Vol 5 No 8 May 2014 ISSN 2039-2117 (online) ISSn 2039-9340 (Print)

Oju, Ebele F. & Olofu, Paul A. "Study habit and its impact on secondary school studnets' academic performance in biology in the Federal Capital Territory, Abuja" Academic Journal: Educational Research Reviews. Vol. 12(10), ISSN 1990-3839 pp. 583-588, 23 May, 2017

Rader, Laura Pope (2016) "The Effects of Social Promotion and High-Stakes Tests on High School Completion". *ProQuest LLC,* Ph.D. Dissertation, Northcentral University. ISBN: 978-1-33395-3302-5

Reigeluth, Charrles M. & Stein, Faith S. *Instructional-Design Theories and Models, Volume IV*. Indiana University Bloomington, Department of Instructional Systems Technology. 1999

Resurreccion, Jelli Ann & Adanza, Jonathan "Spiral Progression Approach in Teaching Science in Selected Private and Public schools in Cavite" *De La Salle University-DLSU Research Congress Journal* Vol. 3, p. 2-4:2015 Manila, Philippines.

Santos, Lidinila L. et al. (2009) *Module 2 – The Philippine Basic Education Curriculum – Teacher Education Council,* Department of Education. Philippines

SEAMEO-INNOTECH, 2012 "*K to 12 Toolkit – Resource Guide for Teacher Educators, School Administrators and Teachers"* ISBN 978-971-0487-58-5 Philippines

Seifert, E.H., and Beck, John J., Jr. "Relationship Between Task Time and Learning Gains Secondary Schools." *Journal of Educational Research* 78 (1984): 5-10.

Sergio, Maria Rose S. "*K-12 Education Reform: Problems and Prospects"* Ateneo de Naga University, Gib'on vol. IX (2011) pp. 70-80. ISSN 165507247

Silva, Joey R. (2015*) The Drawbacks of Mass Promotion in Elementary and Secondary Level in the Philippine Educational System* Retrieved April 1, 2017 from http://www.udyong.net/teachers-corner/6053-the-drawbacks-of-mass-

promotion-in-elementary-and-secondary-level-in-the-philippine-educational-system

Sizemore, Barbara A. (2005) The tests aren't the problem, inadequate instruction is *Journal of Direct Instruction University of Wisconsin, Eau Claire* Retrieved July 5, 2016 from http://chicagoreporter.com/tests-arent-problem-inadeuate-instruction/

Skinner, Lisa M. "*Spiral Assessments: A study in an Accelerated Mathematics Classroom*". Master's Thesis. Lagrange College. LaGrange, Geogla. July 2011.

Snider, Vicki E. (2004) "A Comparison of Spiral versus Strand Curriculum" *Journal of Direct Instruction,* Vol. 4, No. 1 ISSN-1540-0077

Sturgess, Gail (2012) *Skills vs Competencies. What's Difference?* Retrieved April 9, 2017 from http://www.talentalign.com/skills-vs-competencies-whats-the-difference/

Subedi, Bhawani S. (2015) "Assessing the Effectiveness of Teacher Training Programs to Improve the Quality of School Education in Nepal" *Journal of Training and Development.* Volume 1, Issue. ISSSN: 2392-456X (Print). ISSN: 2392-4578(Online)

Taboh, Julia (2015) "*Lack of Materials Hinders Student Success*" Retrieved February 25, 2018 from https://www.theodysseyonline.com/lack-of-material

Taguibao, Julieta D. *The Final Blow of K to 12* https://www.pressreader.com/philippines/sunstarpampanga/20161018/281745563913289

Tattao, Luis A. *Basic Concepts in Statistics (Work text) First Edition*. Rex Book Store, Inc. Manila, Philippines. 2007. ISBN 978-971-23-4693-4

The K to 12 BASIC EDUCATION PROGRAM (as of March 12, 2012) http://ccmdobe.com/wp-content/uploads/2016/03/K-to-12-Curriculum-Guide-DepEd-2012.pdf

Voltz, Deborah et al., (2010) *Connecting Teachers, Students, and Standards* Retrieved February 26, 2018 from http://www.ascd.org/publications/books/109011/chapters/Supporting-the-Classroom-with-Materials-for-Instruction.aspx

Warren, Francesca (2014) *Too Many Students Rely on Social Promotion* Retrieved March 30, 2017 from http://www.huffingtonpost.com/franchesca-warren/social-promotion-is-not-a_b_5896120.html

Yin, Robert K. Qualitative Research from Start to Finish. The Guilford Press- A Division of Guilford Publications, Inc., New York, USA., p. 132-135. 2011. ISBN 978-1-60623-701-4 (pbk.), ISBN 978-1-60623-977-3 (hardcover)

APPENDICES

Appendix

Letter Request to the Schools Division Superintendent for Pilot Testing Permission

Republic of the Philippines
Department of Education
Region VIII
Division of Samar
Catbalogan City

December 4, 2017

MARIZA S. MAGAN, Ed.D., CESO V
Schools Division Superintendent
This Division

Dear Madam:

Greetings!

I have the honor to request permission from your good office to administer my survey questionnaire to the 6th and 10th grade students of Motiong Central Elementary School and Motiong National High School on December 11, 2017 and conduct the retesting of the questionnaire on December 18, 2017.

This request is made in connection with the study I am undertaking entitled, "**OPERATIONAL EFFICIENCY OF K TO 12 SPIRAL APPROACH IN MATHEMATICS**", in partial fulfillment of the requirements for the degree that I am undertaking at Samar State University, Catbalogan City.

Anticipating for your favorable actions in this request.

Very truly yours,

Sgd.MA. EMALYN A. UY
Researcher

Noted:

Sgd. JONAH GAY V. PEDRAZA
Adviser

Recommending Approval:

Sgd. DR. FELISA E. GOMBA
Acting Dean, College of Graduate Studies

Approved:

Sgd. MARIZA S. MAGAN, Ed.D., CESO V
Schools Division Superintendent

Appendix

Letter Request to the School Principal for Pilot Testing Permission

Republic of the Philippines
Department of Education
Region VIII
Division of Samar
Catbalogan City

December 7, 2017

SALVACION J. BACARRA
School Principal II
Motiong National High School
Motiong, Samar

Dear Madam:

Greetings!

I have the honor to request permission from your good office to administer my survey questionnaire to Grade 10 students on December 11, 2017 and conduct the retesting of the questionnaire on December 18, 2017.

This request is made in connection with the study I am undertaking entitled, **"OPERATIONAL EFFICIENCY OF K TO 12 SPIRAL APPROACH IN MATHEMATICS"**, in partial fulfillment of the requirements for the degree that I am undertaking at Samar State University, Catbalogan City.

Anticipating for your favorable actions in this request.

Very truly yours,

(Sgd.)MA. EMALYN A. UY
Researcher

Noted:

(Sgd.)JONAH GAY V. PEDRAZA
Adviser

Recommending Approval:

(Sgd.) DR. FELISA E. GOMBA
Acting Dean, College of Graduate Studies/
Vice President for Academic Affairs

Approved:

Sgd. SALVACION J. BACARRA
School Principal II

Appendix

Letter Request to the School Principal for Pilot Testing Permission

Republic of the Philippines
Department of Education
Region VIII
Division of Samar
Catbalogan City

December 7, 2017

LILIA L. BACARRA
School Principal
Motiong Central Elementary School
Motiong, Samar

Dear Madam:

Greetings!

I have the honor to request permission from your good office to administer my survey questionnaire to Grade 6 students on December 11, 2017 and conduct the retesting of the questionnaire on December 18, 2017.

This request is made in connection with the study I am undertaking entitled, **"OPERATIONAL EFFICIENCY OF K TO 12 SPIRAL APPROACH IN MATHEMATICS"**, in partial fulfillment of the requirements for the degree that I am undertaking at Samar State University, Catbalogan City.

Anticipating for your favorable actions in this request.

Very truly yours,

(Sgd.)MA. EMALYN A. UY
Researcher

Noted:

(Sgd.)JONAH GAY V. PEDRAZA
Adviser

Recommending Approval:

(Sgd.) DR. FELISA E. GOMBA
Acting Dean, College of Graduate Studies

Approved:

(Sgd.)LILIA L. BACARRA
School Principal

Appendix

Letter Request to the Schools Division Superintendent for the Survey Questionnaire

Republic of the Philippines
Department of Education
Region VIII
Division of Samar
Catbalogan City

December 4, 2017

MARIZA S. MAGAN, Ed.D., CESO V
Schools Division Superintendent
This Division

Dear Madam:

Greetings!

I have the honor to request permission from your good office to administer my survey questionnaire to Grade 6 & 10 students in Lawaan Elementary School, Tenani Integrated School, Casandig Elementary School, Wright I Central Elementary School, Lawaan National High School, Casandig National High School and Wright National School and conduct an interview to the mathematics teachers in the same respective schools on January 10-31, 2018.

This request is made in connection with the study I am undertaking entitled, **"OPERATIONAL EFFICIENCY OF K TO 12 SPIRAL APPROACH IN MATHEMATICS"**, in partial fulfillment of the requirements for the degree that I am undertaking at Samar State University, Catbalogan City.

Anticipating for your favorable actions in this request.

Very truly yours,

(Sgd.)MA. EMALYN A. UY
Researcher

Noted:

(Sgd.)JONAH GAY V. PEDRAZA
Adviser

Recommending Approval:

(Sgd.) DR. FELISA E. GOMBA
Acting Dean, College of Graduate Studies

Approved:

(Sgd.)MARIZA S. MAGAN, Ed.D., CESO V
Schools Division Superintendent

Appendix

Letter Request to the Secondary School Principal for the Survey Questionnaire

Republic of the Philippines
Department of Education
Region VIII
Division of Samar
Catbalogan City

January 9, 2018

ROCHELLE G. CABADSAN
School Principal I
Lawaan National High School
Paranas, Samar

Dear Madam:

Good day!

May I have the honor to ask permission from your good office to administer the attached survey questionnaire to Grade 10 students on January 10, 2018 and conduct an interview to your Mathematics teachers on January 17, 2018.

This request is made in connection with the study I am undertaking entitled **"OPERATIONAL EFFICIENCY OF K TO 12 SPIRAL APPROACH IN MATHEMATICS"**, in partial fulfillment of the requirements for the degree that I am undertaking at Samar State University, Catbalogan City.

Anticipating for your favorable actions in this request.

Very truly yours,

(Sgd.) MA. EMALYN A. UY
Researcher

Approved by:

(Sgd.)ROCHELLE G. CABADSAN
School Principal I

Appendix

Letter Request to the Secondary School Principal for the Survey Questionnaire

Republic of the Philippines
Department of Education
Region VIII
Division of Samar
Catbalogan City

January 9, 2018

JEANNE C. VILLANOBOS
School Principal IV
Wright National High School
Paranas, Samar

Dear Madam:

Good day!

May I have the honor to ask permission from your good office to administer the attached survey questionnaire to Grade 10 students on January 11, 2018 and conduct an interview to your Mathematics teachers on January 18, 2018.

This request is made in connection with the study I am undertaking entitled "**OPERATIONAL EFFICIENCY OF K TO 12 SPIRAL APPROACH IN MATHEMATICS**", in partial fulfillment of the requirements for the degree that I am undertaking at Samar State University, Catbalogan City.

Anticipating for your favorable actions in this request.

Very truly yours,

(Sgd.) MA. EMALYN A. UY
Researcher

Approved by:

(Sgd.) JEANNE C. VILLANOBOS
School Principal IV

Appendix

Letter Request to the Secondary School Principal for the Survey Questionnaire

Republic of the Philippines
Department of Education
Region VIII
Division of Samar
Catbalogan City

January 9, 2018

MERCEDES P. DACO, Ed.D.
School Principal III
Casandig National High School
Paranas, Samar

Dear Madam:

Good day!

May I have the honor to ask permission from your good office to administer the attached survey questionnaire to Grade 10 students on January 11, 2018 and conduct an interview to your Mathematics teachers on January 18, 2018.

This request is made in connection with the study I am undertaking entitled "**OPERATIONAL EFFICIENCY OF K TO 12 SPIRAL APPROACH IN MATHEMATICS**", in partial fulfillment of the requirements for the degree that I am undertaking at Samar State University, Catbalogan City.

Anticipating for your favorable actions in this request.

Very truly yours,

(Sgd.) MA. EMALYN A. UY
Researcher

Approved by:

(Sgd.) MERCEDES P. DACO, Ed.D.
School Principal III

Appendix

Letter Request to the Secondary School Principal for the Survey Questionnaire

Republic of the Philippines
Department of Education
Region VIII
Division of Samar
Catbalogan City

January 9, 2018

EMMELINE S. GABON
School Principal IV
Tenani Integrated School
Paranas, Samar

Dear Madam:

Good day!

May I have the honor to ask permission from your good office to administer the attached survey questionnaire to Grade 10 students on January 10, 2018 and conduct an interview to your Mathematics teachers on January 17, 2018.

This request is made in connection with the study I am undertaking entitled "**OPERATIONAL EFFICIENCY OF K TO 12 SPIRAL APPROACH IN MATHEMATICS**", in partial fulfillment of the requirements for the degree that I am undertaking at Samar State University, Catbalogan City.

Anticipating for your favorable actions in this request.

Very truly yours,

(Sgd.) MA. EMALYN A. UY
Researcher

Approved by:

(Sgd.) EMMELINE S. GABON
School Principal IV

Appendix

Letter Request to the Secondary School Principal for the Survey Questionnaire

Republic of the Philippines
Department of Education
Region VIII
Division of Samar
Catbalogan City

January 9, 2018

VERNALIZA D. MEJIDO
School Head
Lawaan Elementary School
Paranas, Samar

Dear Madam:

Good day!

May I have the honor to ask permission from your good office to administer the attached survey questionnaire to Grade 6 students on January 10, 2018 and conduct an interview to your Mathematics teachers on January 17, 2018.

This request is made in connection with the study I am undertaking entitled "**OPERATIONAL EFFICIENCY OF K TO 12 SPIRAL APPROACH IN MATHEMATICS**", in partial fulfillment of the requirements for the degree that I am undertaking at Samar State University, Catbalogan City.

Anticipating for your favorable actions in this request.

Very truly yours,

(Sgd.) MA. EMALYN A. UY
Researcher

Approved by:

(Sgd.) VERNALIZA D. MEJIDO
School Head

Appendix

Letter Request to the Secondary School Principal for the Survey Questionnaire

Republic of the Philippines
Department of Education
Region VIII
Division of Samar
Catbalogan City

January 9, 2018

LUZVIMINDA TABONES
School Principal
Wright I Central Elementary School
Paranas, Samar

Dear Madam:

Good day!

May I have the honor to ask permission from your good office to administer the attached survey questionnaire to Grade 6 students on January 11, 2018 and conduct an interview to your Mathematics teachers on January 18, 2018.

This request is made in connection with the study I am undertaking entitled "**OPERATIONAL EFFICIENCY OF K TO 12 SPIRAL APPROACH IN MATHEMATICS**", in partial fulfillment of the requirements for the degree that I am undertaking at Samar State University, Catbalogan City.

Anticipating for your favorable actions in this request.

Very truly yours,

(Sgd.) MA. EMALYN A. UY
Researcher

Approved by:

(Sgd.) LUZVIMINDA TABONES
School Principal

Appendix

Letter Request to the Secondary School Principal for the Survey Questionnaire

Republic of the Philippines
Department of Education
Region VIII
Division of Samar
Catbalogan City

January 9, 2018

VIRGINIA A. PAGARAO
School Principal
Casandig Elementary School
Paranas, Samar

Dear Madam:

Good day!

May I have the honor to ask permission from your good office to administer the attached survey questionnaire to Grade 6 students on January 11, 2018 and conduct an interview to your Mathematics teachers on January 18, 2018.

This request is made in connection with the study I am undertaking entitled "**OPERATIONAL EFFICIENCY OF K TO 12 SPIRAL APPROACH IN MATHEMATICS**", in partial fulfillment of the requirements for the degree that I am undertaking at Samar State University, Catbalogan City.

Anticipating for your favorable actions in this request.

Very truly yours,

(Sgd.) MA. EMALYN A. UY
Researcher

Approved by:

(Sgd.) VIRGINIA A. PAGARAO
School Principal

Appendix

Letter Request to the Teacher-Respondents

SAMAR STATE UNIVERSITY
GRADUATE SCHOOL
Catbalogan City

January 9, 2018

Dear Respondents:

Good day!

The undersigned is a student of the Master of Arts in Teaching (MAT) major in Mathematics. As part of the requirements for graduation from the said degree, she is conducting a study entitled, **"OPERATIONAL EFFICIENCY OF K TO 12 SPIRAL APPROACH IN MATHEMATICS".**

In this regard, the undersigned would like to ask favor from you to provide information relative to you. Attached is a survey questionnaire especially designed for this purpose. Rest assured that your responses will be treated with utmost confidentiality.

Thank you very much and God bless.

Respectfully yours,

(Sgd.) MA. EMALYN A. UY
Researcher

Appendix

Semi-structured Format for Interview and Focus Group Question

(For Mathematics Teachers)

Moderator Introduction: My name is Ma. Emalyn A. Uy, a Master of Arts in Teaching student of Samar State University. I am conducting this interview in relation to my study on the "Operational Efficiency of K to 12 Spiral Approach in the Mathematics". I am going to lead the discussion. We are here to evaluate the current status of the implementation of K to 12 spiral Mathematics in relation to this assessment result shown in the bar graph and this view questions as follow:

1. Why was K to 12 spiral approach as our new curriculum put into law?
2. What preparations did you make in yourself? in your school?
3. What observations do you have about the implementation of the K to 12 spiral instruction?
4. From among these concerns which you have identified, which do you think were responded by the concerned authorities?
5. What particular initiatives, actions, or projects/activities were undertaken in order to solve these problems?
6. Are you satisfied with these initiatives?
7. What do you think are the factors that hinder the effective implementation of K to 12 spiral approach?
8. If not, what can you suggest in order to further improve the conditions or solve the problems?
9. Do you agree that it is necessary to augment the learning materials for K to 12 spiral instruction?
10. If so, in a scale of ten where 10 is the most necessary, how do you see the level of necessity of the need to augment these materials?
11. Do you observe or experience the same result every time you teach or present a lesson?
12. Why does students were promoted even if they have not passed the proficiency standards in their present level?
13. How do other factors such as teacher training, experience, student access to materials, and school size influence student outcomes?
14. How do the students skills progress as they complete the curriculum?
15. Is spiraling handled differently across year levels?

Appendix

Questionnaire for the Mathematics Teachers

Part I. Profile of the Respondents

Directions: Please answer the following questions by putting a check (/) mark on the blank spaces provided and by writing on the blanks the required information.

1. Name: (optional) _____
2. Educational Background:
   (__) Ph.D./Ed.D., etc.
   (__) MA + Doctoral Units
   (__) MA/MAEd/MS
   (__) MA/MAEd/MS Units
   (__) Bachelor's Degree

3. Length of Service: _____

4. Seminars/Trainings Attended in Mathematics:

Level	No. of Trainings Attended				
National	None( )	1( )	2( )	3( )	More:____(please specify)
Regional	None( )	1( )	2( )	3( )	More:____(please specify)
Division	None( )	1( )	2( )	3( )	More:____(please specify)
School	None( )	1( )	2( )	3( )	More:____(please specify)

5. Learning Materials Used in Teaching:

_____	_____	_____
_____	_____	_____
_____	_____	_____
_____	_____	_____
_____	_____	_____

Appendix

Letter Request to the Student-Respondents

SAMAR STATE UNIVERSITY
GRADUATE SCHOOL
Catbalogan City

January 9, 2018

Dear Respondents:

Good day!

The undersigned is a student of the Master of Arts in Teaching (MAT) major in Mathematics. As part of the requirements for graduation from the said degree, she is conducting a study entitled, **"OPERATIONAL EFFICIENCY OF K TO 12 SPIRAL APPROACH IN MATHEMATICS".**

In this regard, the undersigned would like to ask favor from you to provide information relative to you. Attached is a survey questionnaire especially designed for this purpose. Rest assured that your responses will be treated with utmost confidentiality.

Thank you very much and God bless.

Respectfully yours,

(Sgd.) MA. EMALYN A. UY
Researcher

Proficiency Test in K to 6 Spiral Approach

Part I. Personal Profile of the Respondents

DIRECTION: Please supply the needed information by filling out the space provided in each item.

Name:_____Grade 6 __

Age: _____ Sex: _____ Grades in Math: _____1st
_____2nd

Part II. Level of Proficiency

DIRECTION: Read and understand carefully each question. Choose the letter of the correct answer, then write it on the space provided before the number.

____1. Which fraction has the smallest value?

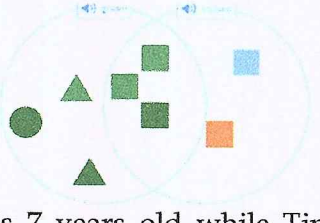
A. $\frac{1}{5}$ B. $\frac{1}{4}$ C. $\frac{1}{3}$ D. $\frac{1}{2}$

____2. An old book has missing pages. Next to page 20 is page 35. How many SHEETS of paper were missing?

A. 15 B. 7 C. 8 D. 10

____3. How many shapes are green?

A. 1
B. 2
C. 3
D. 6



____4. Today, Ben is 7 years old while Tina is 9 years old. What will be the sum of their ages next year?

A. 16 B. 18 C. 20 D. 22

____5.The length of a rectangular field is 80 meters. Its width is 20 meters. Mark ran around this rectangular field 5 times. How many meters did he run?

A. 100 meters
B. 200 meters
C. 500 meters
D. 1000 meters

____6. When rounded to the nearest thousand, the number of people who attended a concert is 18,000. Which of the following could be the number of people who attended the concert?

A. 17,264 C. 18,135
B. 17,428 D. 18,526

____7. Dale sorted through the family junk drawer and found some tape measures, gift bags and flashlights. He made a picture graph of the items he found:

tape measures							
gift bags							
flashlights							

Which item did he find the most?

A. Tape measure
B. Gift bags
C. Flashlights
D. Tape measure and gift bags

____8. 63 is 6 tens plus 3 ones. Which is another way to make 63?

A. 5 tens plus 3 ones
B. 5 tens plus 13 ones
C. 3 tens plus 16 ones
D. 4 tens plus 3 ones

____9.What shape is missing from the pattern?

○●☆★○●☆★○● ? ★○●☆

A. ○
B. ★
C. ☆
D. ●

____10. Terrell circled a digit in the numbershown below.

3285

What is the value of the digit Terrellcircled?

A. 2 B. 20 C. 200 D. 2000

____11. Which symbol correctly completes the number sentence 9+5 ☐ 18 +5?

A. + B. = C. ≥ D. ≤

____12. Ram had 342 coins in his collection. How would you write 342?

A. Three four two
B. Three forty two
C. Three hundred forty two
D. Three hundred four two

____ 13. What is the greatest common factor of 24 and 30?

A. 2 B. 4 C. 6 D. 8

____14. Which list is in order from least to greatest?
A. 1,000; 1,010; 1,009
B. 1,010; 1,011; 1,100
C. 1,100; 1,010; 1,001
D. 1,010; 1,100; 1,001

___15.Three hundred and one can be written as:__.
A. 31 C. 301
B. 310 D. 3001

____16.A football is shown below. 
Which shows $\frac{3}{5}$ of the balls as footballs?

A. 

B. 

C. 

D. 

____17. What is prime factorization of 48?
A. 2 x 2 X 2 x 2 x 3
B. 2 x 2 x 2 x 3
C. 2 x 3 x 4
D. 2 x 12 x 2

____18. Which of the following is an improper fraction?
A. $\frac{4}{7}$ B. $\frac{2}{5}$ C. $\frac{4}{3}$ D. $\frac{1}{4}$

____19. $\frac{19}{6}$ is a number between _____.
A. 2 and 3 C. 19 and 20
B. 3 and 4 D. 6 and 18

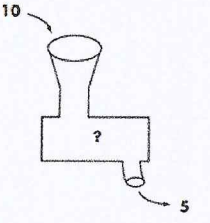
____20. Michelle has 7 packages of crayons. Each package has ☐ crayons. She has a total of 42 crayons. Michelle uses the number sentence below to find how many crayons are in each package. $7 \times \square = 42$

How many crayons are in each of Michelle's packages?
A. 6 crayons C. 35 crayons
B. 8 crayons D. 49 crayons

____21.Which number correctly completes the subtraction sentence 5.0 – 3.25 = ___?
A. 1.25 C. 2.25
B. 1.75 D. 2.75

____22. Marie wrote the following riddle to her friend: **I have 2 faces, no vertices, and I can roll.**
What shape am I?What is the answer to the riddle?
A. Cone C. Sphere
B. Cylinder D. Prism

____23. When 10 is dropped into this machine, it comes out as 5. When 16 is dropped in, it comes out as 8. When 4 is dropped in, it comes out as 2. If 8 is dropped into the machine, what number will come out?



A. 3 C. 5
B. 4 D. 6

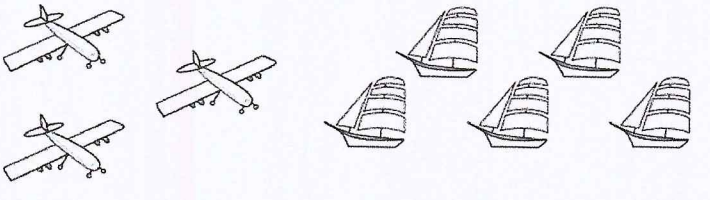
____24.What is the value of MMDCLXXII in hindu Arabic?
A. 2,600,072 C. 2,000,672
B. 2,510,522 D. 2,500,172

____25. Jayson has 357 marbles. He puts them in sets of 10. How many extra marbles are there?
A. 3 B. 5 C. 7 D. 57

____26. Which percent equals $\frac{1}{4}$?
A. 14% B. 25% C. 41% D. 52%

____27.Which one of the following is correct?
A. 4+2 = 6 C. 2*6 = 8
B. 4*2 = 6 D. 6+2 = 12

____28.The diagram below shows some modelairplanes and some model ships.



What is the ratio of the number of model airplanes to the number of model ships?
A. 8: 3 C. 3: 8
B. 5: 3 D. 3: 5

____29.Ram is reading a story book containing 260 pages. He has completed reading 180 pages. How more pages should he read to complete the book?

A. 60 B. 80 C. 40 D. 120

____30.Addie got to the park at 7:45. While she was there, she walked her dog for 35 minutes and played for 15 minutes. At what time did Addie leave the park?

A. 8:00 C. 8:30
B. 8:20 D. 8:35

____31. Madison finished $\frac{4}{5}$ of her homework before dinner. What percent of Madison's homework is left to finish?

A. 15% C. 45%
B. 20% D. 80%

____32.Jane, Frank, and Denise each cut a length of ribbon.

Jane's ribbon is 0.5 meter long.
Frank's ribbon is 0.39 meter long.
Denise's ribbon is 0.4 meter long.

Which statement about the lengths of the ribbons is true?

A. Jane's ribbon is longer than Frank's ribbon.
B. Denise's ribbon is longer than Jane's ribbon.
C. Frank's ribbon is longest.
D. Denise's ribbon is shortest.

____33.Mario began watching a movie at the time shown on the clock. The movie was 2 hours and 25 minutes long. What time did the movie end?

A. 7:55 P.M.
B. 8:30 P.M.
C. 9:30 P.M.
D. 9:55 P.M.

____ 34. At West Elementary School, there are 20 more girls than boys. If there are 180 girls, how can you find the number of boys?

A. Add 20 to 180
B. Subtract 20 from 180
C. Multiply 180 by 20
D. Divide 180 by 20

____35. Mark is 6 years old. His sister Tina is half of his age. So when Mark is 100 years old, how old is Tina?

- It is a multiple of 2.
- It is a factor of 18.
- It is a composite number.

A. 50 B. 28 C. 97 D. 98

____36. Jody read the clues below about a mystery number.

Which of these numbers could be themystery number?

A. 2 B. 6 C. 9 D. 12

____37. Brooke's baby, Ryan, weighed 7 pounds when he was born. Brooke weighed her baby each month after he was born. Ryan's weight each month, in pounds, is shown in the table below.

Ryan's Weight

Age	Weight (pounds)
birth	7
1 month	9
2 months	11
3 months	13
4 months	15

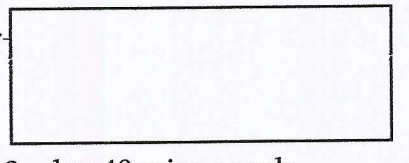
Which statement about the weight of the baby is true?

A. The baby gained 1 pound each month.
B. The baby gained 2 pounds each month.
C. The baby gained 9 pounds in the first month.
D. The baby gained 15 pounds in the last month.

____38. The original price of a toy was Php15. If the price is reduced by 20%, what is the new price of the toy?

A. $12 C. $14.80
B. $17 D. $5

____39.



3 hrs 40 mins equals ____.

A. 120 mins C. 220 mins
B. 180 mins D. 240 mins

____40.The numbers below follow a pattern.

4, 14, 10, 20, 16, 26, 22, 32, 28

What is the rule for the pattern?

A. add 10
B. subtract 10, add 4
C. subtract 4
D. add 10, subtract 4

Proficiency Test in K to 10 Spiral Approach

Part I. Personal Profile of the Respondents

DIRECTION: Please supply the needed information by filling out the space provided in each item.

Name:_____Grade 6 - _____

Age: _____ Sex: _____ Grades in Math: _____1st

_____2nd

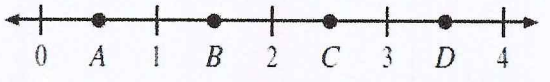
Part II. Level of Proficiency

DIRECTION: Read and understand carefully each question. Choose the letter of the correct answer, then write it on the space provided before the number.

____1. If A = {1, 3, 5, 7, 9} and B = {2, 3, 5, 7}, what is A ∪ B?

A. {3, 5, 7}
B. {2, 3, 5, 7}
C. {2, 3, 5, 7, 9}
D. {1, 2, 3, 5, 7, 9}

____2. Which point shows the location of $\frac{3}{2}$ on the number line?



A. Point A
B. Point B
C. Point C
D. Point D

____3. Which of the following fractions is closest to 0?

A. $-\frac{5}{12}$ B. $-\frac{2}{3}$ C. $\frac{5}{6}$ D. $\frac{3}{4}$

____4. Which shows 833,000 written in scientific notation?

A. 8.33×10^4
B. 8.33×10^5
C. 8.33×10^{-3}
D. 8.33×10^{-5}

____5. What is $\frac{12}{60}$ expressed in lowest terms?

A. $\frac{1}{8}$ B. $\frac{1}{6}$ C. $\frac{1}{5}$ D. $\frac{1}{4}$

____6. Mark is 6 years old. His sisters Tina is half of his age. So when Mark is 100 years old, how old is Tina?

A. 50 B. 28 C. 97 D. 98

____7. If 12 inches = 1 foot, then how many inches are there in $2\frac{1}{2}$ *feet*?

A. 24 inches
B. 25 inches
C. 29 inches
D. 30 inches

____8. One morning, the temperature was 5° below zero. By noon, the temperature rose 20° Fahrenheit (F) and then dropped 8°F by evening. What was the evening temperature?

A. 17□ below zero
B. 15□ below zero
C. 12□ above zero
D. 7□ above zero

____9. $(5 + 2)[6 - (3 + 2)]=$

A. 7 B. 8 C. 12 D. 13

____10. Which property is used in the equation below?

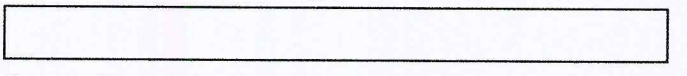
$12(x + 4)= 12x + 48$

A. Associative Property of Addition
B. Commutative Property of Addition
C. Distributive Property
D. Reflexive Property

____11. Which expression is equivalent to $7^5 \times 7^{10}$?

A. 7^{15} B. 7^{50} C. 49^{15} D. 49^{50}

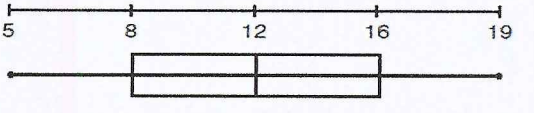
____12. Jeremiah is on the Eagles bowling team. His scores for the last 12 games are shown below.



What is the mode of the scores?

A. 90 B. 102 C. 104 D. 110

____13. The following data represent the number of years of different students in a certain group have gone to school together: 12, 5, 8, 16, 15, 9, 19. These data are shown on the box-and-whisker plot below.



What is the median of the data?

A. 5 B. 8 C. 12 D. 16

____14. The number of kilograms of rice consumed by a family for a month is related to the number of its members. Which of these is the INDEPENDENT variable?

A. numbers of kilograms of rice consumed
B. family members
C. month
D. rice

____15. $(4x^2 - 2x + 8) - (x^2 + 3x - 2) =$

A. $3x^2 + x + 6$ C. $3x^2 - 5x + 6$

B. $3x^2 + x + 10$ D. $3x^2 - 5x + 10$

____16."When eight is subtracted from five times a number the result is six." Which of these is the correct translated mathematical phrase?

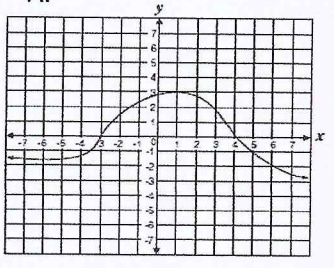
A. $8 - 5x = 6$ C. $5x - 8 = 6$
B. $5x - 6 = 8$ D. $8 - 6x = 5$

____17. What is x if $3x = 84$?

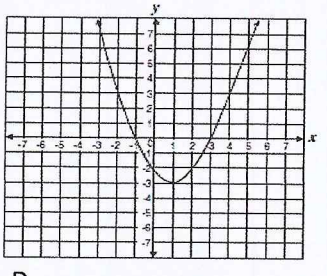
A. 20 B. 21 C. 26 D. 28

____18. Which of the following graphs represents a relation that is NOT a function of x?

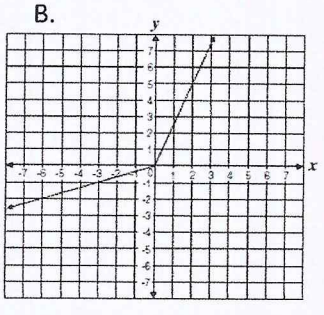
A.



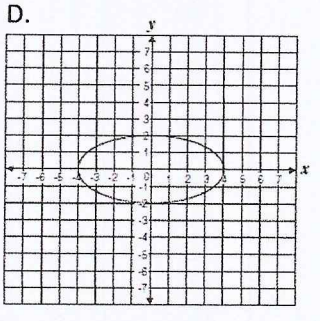
C.



B.



D.



____19. What is the y-intercept of the graph of $y = -\frac{1}{3}x + 2$?

A. $-\frac{1}{3}$ B. -1 C. 3 D. 2

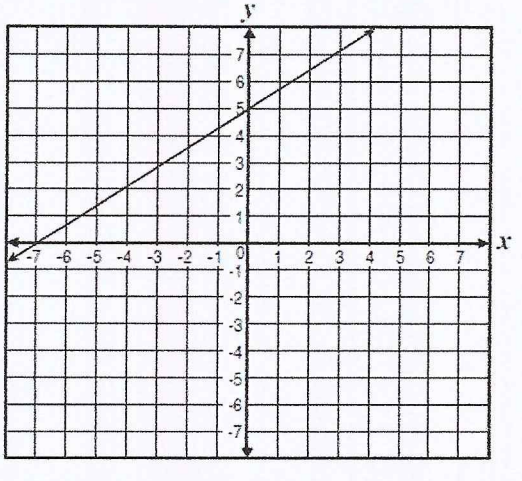
____20. What is the slope of the line?

A. -7

B. $-\frac{5}{7}$

C. $\frac{5}{7}$

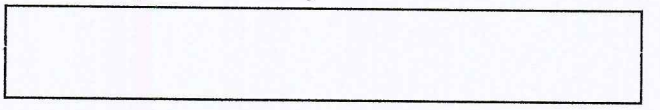
D. 5



____21. What is the value of the of the function (x) = $2x^2 - 8$ at f(2)?

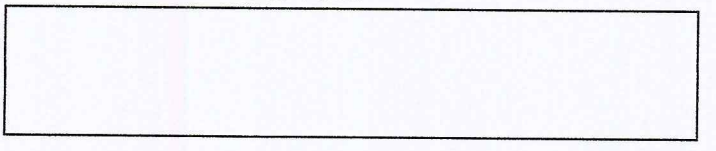
A. -4 B. -2 C. 2 D. 0

____22. Which of these figures serve as a counterexample to the conjecture below?



A. Rectangle C. Square
B. Rhombus D. Trapezoid

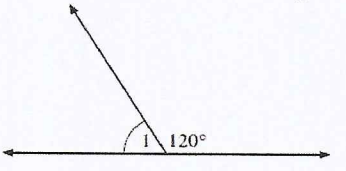
____23. What kind of law is applied to draw out conclusion in this statement?



A. Biconditional C. Detachment
B. Converse D. Syllogism

____24. What is the measure of angle 1 in the figure below?

A. 30□ C. 60□
B. 40□ D. 80□



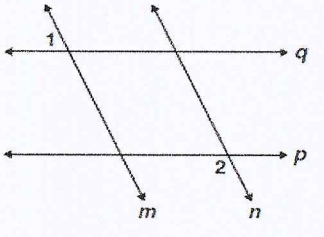
____25. Supplementary angles are composed of two angles having a sum of 180□. From this theorem, what is the supplement of 40□?

A. 40□ B. 90□ C. 140□ D. 220□

____26. Given: $p \parallel q$; $m \parallel n$; $m\angle 1 = 75°$

What is $m\angle 2$?

A. 15□
B. 75□
C. 90□
D. 105□



____27. What is the factored form of $x^2 + 5x + 4 = 0$?

A. $(x + 2)(x + 2)$ C. $(x + 4)(x - 1)$
B. $(x + 1)(x + 4)$ D. $(x - 1)(x - 4)$

____28. A group of 50 students are selected to answer a survey out of 1200 Grade 10 students. What do you call this group of students?

A. Population C. Statistics
B. Parameter D. Sample

____29. Based on the table below, what percent out of the student number of donors have blood type O?

A. 40%
B. 25%
C. 20%
D. 15%

Blood Donors	
Blood Type	No. of Students
A	8
B	10
AB	6
O	16

____30. What quantity should be added to both sides of this equation to complete the square?

$x^2 - 8x \_\_ = 5 + \_\_$

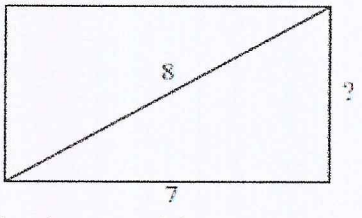
A. 4 B. -4 C. 16 D. -16

____31. A company makes 5 blue cars for every 3 white cars it makes. If the company makes 15 white cars in one day, how many blue cars will it make?

A. 9 B. 13 C. 17 D. 25

____32. What is the height of this rectangle?

A. 1 unit
B. 6 units
C. $\sqrt{15}$ units
D. $\sqrt{113}$units



____33. What is the result after simplifying $2\sqrt{3} + 4\sqrt{3} - 5\sqrt{3}$?

A. $-\sqrt{3}$ C. $11\sqrt{3}$
B. $\sqrt{3}$ D. $21\sqrt{3}$

____34. With respect to the given angle, what is the corresponding ratio of the hypotenuse to the opposite side of the angle?

A. Sine C. Tangent
B. Cosine D. Cosecant

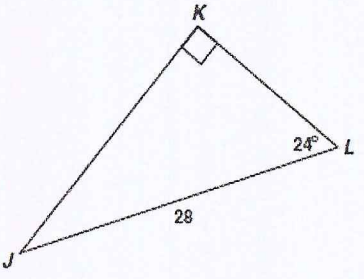
____35.Triangle JKL is shown below.Which equation should be used to find the length of $\overline{JK}$?

A. Sin 24□ $= \frac{JK}{28}$

B. Sin 24□ $= \frac{28}{JK}$

C. Cos 24□ $= \frac{JK}{28}$

D. Cos 24□ $= \frac{28}{JK}$



____36. Look at this series: 7, 10, 8, 11, 9, 12, ... What number should come next?

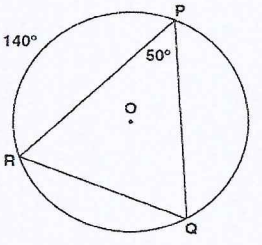
A. 7 B. 10 C. 12 D. 13

____37. The numbers below follow a pattern.
4, 14,10, 20, 16, 26, 22, 32, 28, ...
What is the rule in the pattern?

A. Add 10
B. Subtract 10, add 4
C. Subtract 4
D. Add 10, subtract 4

____38. In the circle shown below, the measure of $\overset{\frown}{PR}$=140° and the measure of ∠RPQ = 50□. What is the measure of $\overset{\frown}{PQ}$?

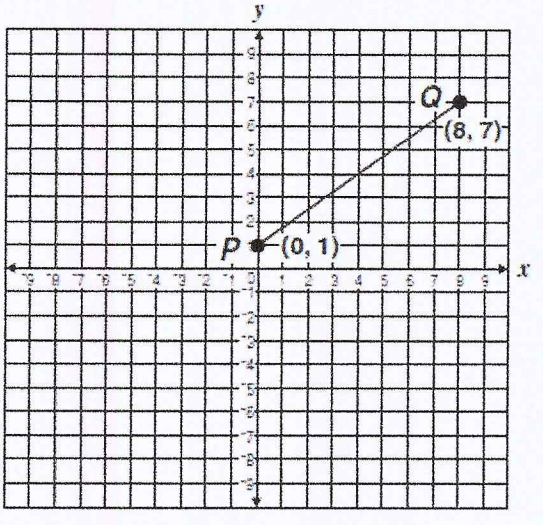
A. 50□
B. 60□
C. 70□
D. 120□



____39. Which of the following would give the coordinates of the midpoint of P(-6, 13) and Q(9, 6)?

A. $\left(\frac{-6+13}{2}, \frac{9+6}{2}\right)$ C. $\left(\frac{-6-13}{2}, \frac{9-6}{2}\right)$
B. $\left(\frac{-6+9}{2}, \frac{13+6}{2}\right)$ D. $\left(\frac{-6-9}{2}, \frac{13-6}{2}\right)$

____40. What is the length of line segment PQ shown below?



A. 9 units B. 10 units C. 13 units D. 14 units

Appendix

Teachers' Responses on the Interview and Focus Group Discussion

School	Teacher-Respondent	Responses
A	#1	• An CG an nag-gu-guide ha amon ma'am kon waray kami mga materials
	#2	• Gin-hohome visitation namon an kabataan nga diri danay napakita ha klase kay makuri man nga bagsakon hiya hin diri kita maaram han iya rason kon kay ano nag-iinabsent
	#3	• Mga pasaway pa naman yana it kabataan imbes nga nagkaklase ka na konta nakakaon logod an time papinansaway han kabataan
	#4	• Bisan anon imo pagsiniring nga pasudla an bata an kag-anak diri pinan-nginginano an iya bata.
	#5	• Ako nagpaxerox la kay maghinulat ka la ngani han hatag han gobyerno an kabataan mahuhung hit leksyon.
	#6	• Diri man liwat it amon head nagpapaphotocopy han mga LM kaya kami la it naprovide hit amon • Korek, tas kon igdodrop n an bata duro pagpinakamalooy an nanay kay diri maaram hit sitwasyon hit iya bata nga riri nasulod.
	#7	• Mostly an bata diri mathematically inclined mayda hia subject nga didto hia na-excell so ito pala you need to consider that situation..amo nga mostly affected an achievement result. • Aw kay may iba pa ito nga mga factors that you need to consider with this assessment result.
B	#1	• Malulu-oy ka man ta liwat kon kay babagsakon an bata kay maiisip mo man liwat nga someday mahinganga-upay ini hiya. Magiging sundalo ganun. • Ako ma'am. Science tak major and for almost 9 years na ak nagtututdo Math. • Kon may kulang nga LM, napasabot la kami hit amon head nga mayda namon kailangan, an then naprovide iton hiya
C	#1	• Amon a bahalan nga mga secondary mag-intindi hit amon sitwasyon. Maaram man ngani it hira.
	#2	• Kay kon hi kami la ma'am kon pwede la nga haros katunga hit klase it bumagsak nakikita udog nga diri maupay it resulta hit nga graph pala..pero mag-aano man kay pati it school head ginkokontra ka..it mga kag-anak ha iya napa-ugop..pabay-an nala.
	#3	• Kay bisan man it mga hagrani la nga kabataan diri nagkakasulod..talaga gud nga diri nakakagmandar an kag-anak han iya anak nga sumulod. • Nagsusuggest an amon head nga igmodular an bata kon most of the time..or kon ma-absenon gud an bata.
	#4	• Tungod kay harayo man it balay hit iba nga bata, danay nagpapadara kami kasuratan pagpasabot nga it ira bata diri nasulod
	#5	• An home visitation ma'am diri sapat para ig-encourage an bata nga sumulod kailangan nga an parents an magmotivate han bata nga sumulod.
	#6	• Kon igmodular an bata diri gihap ito sapat kay diri nia hibabaru-an kon inano an pag-answer..waray nia ka-experience kon panu igsolve an topic panapangon man la ito pag-answer tapos ano dara kay ginmodular hia..matapod na nga mapapasar.
D	#1	• Oo, kay tig-usa man la an ginhatag didton amon seminar. • Kon igpromote an bata. An masunod nga teacher it kukurian.

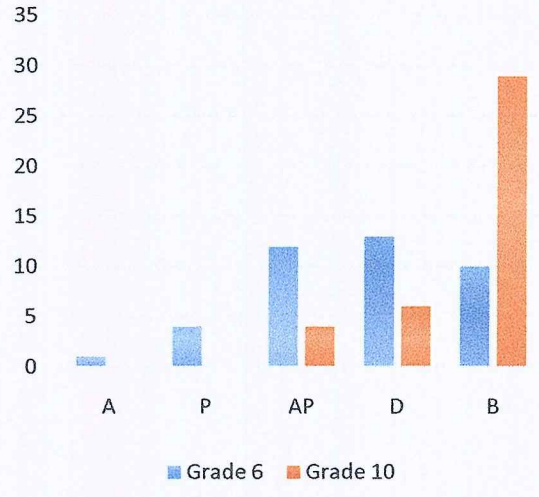
		Macha-challenge gud hiya pagtutdo. • Sus kay ikaw nga Math teacher, maaram ka kon ano it igtututdo sano hito nga mga parallel lines. Magtitinutdo ka ba hini nga lesson kon diri pa hira maaram hadi? • Bisan anot imo paninindigan as a teacher kay in the end pag-abot han March, pasar bisan kulang hia han knowledge kay may mga target man liwat kami hini ha school
	#2	• Kay an Curriculum Guide (CG) nala ini an amon ginbasehan pagtutdo. • Mas maupay gad liwat kon related ha Math kay para na-u-updated kita han kabag-uhan ba. • Gin-aadman ko anay an lesson task on may ginhahatag ngani ak nga practice exercise napatutdo ak danay ha ak mga kaco-teachers kon aanuhon • Yes ma'am, kaya minsan paremedial gihap kay para makahabol an iba • Nanhuhuram la ako hn CG,TG or LM kay pagkasunod nga school year nagbabaralyo kami subject. • Ngan konta waray la anay ini nga kabataan panmasara han elementary..aware man unta hira han learning pgress han ira kabataan
	#3	• May ada gad pero tig-urusa la ito kacopy nga CG kada Grade level salit manhin iya-iya nala kami pagprovide hit amon kalugaringon kay kami man gihap it kinukurian. • Tuman, ini hi sir, naghuhuram-huramay la kami. • Tas ko magpaxerox ka, mahingangadto ha iya an subject mo dati nga subject, dara an imo LM tas ako waray na magagamit nga LM han Math kaya ko anot available amo it gagamiton nala. Tutal amo man gihap an bagan ginsuggest didto han training. • Kay diri gad udog maupay it resulta kon pinanmamasar an kabtaan nga diri magsulod kay ano man it ira hibabru-an?
	#4	• Kulang it usa ka oras hit Math hini nga spiral curriculum kay kadamo han kailangan ig-cover • Mapapasar it bata bisan talagsa la nasulod kay it amon school head pa an nagpupush ha am nga kon pwede ig-avoid it pagpinanbagsak kay ha amon la gihap mabalik..mareflect kon kay ano nga waray kapasar inin nga bata.
E	#1	• Maupay an spiral kay pag-idiscuss mon a an lesson nga na-encounter na nira..ginlelevel-up la an learning han bata in terms of presenting examples. • Para iwas stress..pasar nala an bata labi na kon malabad..kay ma-i-stress ka la.
	#2	• For compliance naman la it natatabo yana nga mga teachers' trainings. Waray may nagsusupervise kon gin-apply ba ini nga nahibaru-an didan seminar. • An seminar related gad gihap ha class instruction pero diri sapat para ma-ifully implement namon ha discussion kay mas macoconfuse an bata pag-adapt han lesson.
	#3	• Ha spiral approach, kukurian ka pagtutdo kon waray pa hibaro an bata han lesson nga igtututdo..Kasi marerealize mo man ito kon nag-agi nat hira nga lesson as your review kon na-agi-an nira han previos lesson tas marecall, maupay pero kon nanhingalimot ibig sabihin waray gud ito ka-emphasize ha bata an discussion.
	#4	• Pasar bisan waray sabot hito nga test nimo ma'am ngani..api man ito hit ak lesson kay gin-aavoid an magbagsak. "No child will be left " kunuhay siring han DepEd kay that is our mission to teach a

		child ngan pamiling pa-agi para hibaro hiya.
F	#1	• Depende ha lesson ma'am. Agi-an ngani han topic nga para ha kabataan makuri. Kulang it usa ka oras. • Nagpaparemidial class ako ma'am kon diri namemeet han bata an discussion para diri na ak mgsummer class ha ira.
	#2	• Danay kon igtututdo liwat adi nga lesson, haros kaunon an pira ka minuto pagreview la han gindiscuss na nga topic kay nanhingalimot an kabataan. • Katapos hadto nga mga seminar kada tuig han pagtikang hini nga K to 12 yana waray na ito kasundi
G	#1	• An mga dati nga libro an amon ginagamit. • Yes ma'am ini yana nga Grade 6an first batch nga makaka-complete han K to 12 nga nag-agi han spiral from the very beginning. • Ngan iniiwasan gud namon nga magkamay-ada mga retained or drop-outs kay bawal na it yana hini nga K to 12.
	#2	• Ah kay hi ako..an mga available na gad la nga libro akon gingagamit kay diin man kami makuha han pondo pagmalakakaprovide han amon igturutdo. • Waray kami mga retained ma'am kay kon diri na nasulod an bata..gindodropped ito kon waray gihap kadara han home visitation kasi mismo an nanay an nasiring nga diri na tisulod an iya bata..ibabalik nala kono utro hit Grade 4 sugad hito kay anxa karuyag han iya anak
	#3	• Bisan it pag-attend hit kada quarter nga meeting, dako ito nga butang kay para nasusubay-bayan han nanay/tatay an iya anak
	#4	• An curriculum guide an amon ginagamit pagkita han mga masunod nga topic.
	#5	• Recommended man ito nga old books han yana nga curriculum..Makukuri-an kala ugaring panmiling han mga masunod na kay nagspiral na an approach.
	#6	• Waray problema han magsulod nga bata, kon diri masulod mas maupay talaga nga dapat ginpapanginano han kag-anak an ira mga anak kay hira man gud ito it nakakasagdon kon diri bumali an bata ha aton.
	#7	• Naghahatag amon school head han mga copies pero diri nagtatag-urusa..at least gihap mayda
	#8	• An nanay an mag-guide gud han bata hit kaupayan kon nahibabaro hia kay para man gihap ito ha iya future.
H	#1	• Mag-aano man kita? Kay di ba ngani, bisan iton nga Grade 10 yana naton nga kabataan, aada na hira ha Grade 10 pero kita-a la, an mga libro han Grade 8 nagkaka-abot pala han last year ngan diri pwede magtig-urusa an bata kay kulang man. • Na-iinterupt an klase ky mayda Festival of Talents, MTAP contest nga dinhi natatabo ha amon school • Share-share la books an kabataan pati ngani kami nga teachers naghuhuramay la TG kay usa man la ito • Ito nga result ma'am an foundation han kabataan hit dida is han ira pa kanan elementary nga diri K to 12.
	#2	• Waray ito manhingalimot an kabataan. Waray ito katutdo ha ira han ira Grade 8 nga topic. Amo nga diri it mag-aram. • Aw kay mayda gad oo, pero kay diri man gud ito related han Math. Kanan classroom management la sugad hito. • Ito nga mga beginning ngada an amon ito mga very good ha klase..mga diri ito magsulod mam. • Natigdaan man gud la dayon ini nga kabataan pg-adjust kahibaro

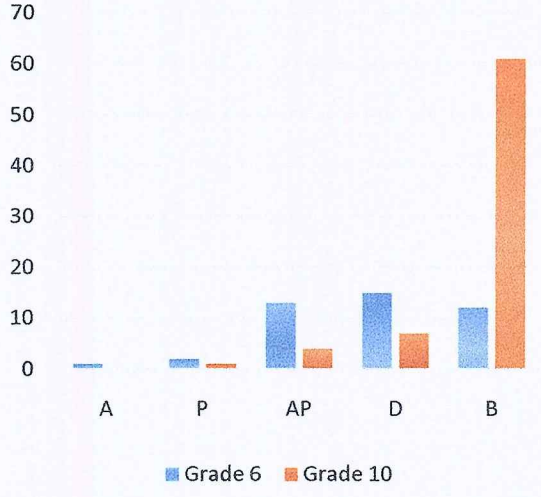
		han K to 12 ..asay pa kay nag-iba an approach an diri nira maaram nga concept han elementary na-aapear ha high school.
	#3	• Ngan adi pa. Waray pa kami dinhi libro han Grade 7 nga Mathematics. Ambot pinan-ngangano it nga DepEd. • Kon waray nira kabaru-I an lesson nga dapat ha elementary unta nira nahibaru-an, kami ngateachers an mas kinuri-an pag-adjust kay tikang ha iba-iba nga elementary schools an kabata-an tas an iba diri pa maaram magbasa. • Damo man nga factors it kailangan ig-consider bangin la diri nakakasulod kay waray ig-parasahi amo nga nag-iinabsent.
	#4	• Han kanan elementary spiral na hira pero ini nga high school yana an mga previous learning ini nira is an kanan elementary pa. • Dara man gud liwat hin kadamo han buruhaton, mga school activities, mga reports nga igsurubmit, nakakulangan kami oras pagcover han mga competencies ha module. • Sobran kadamo an kailangan macover nga topics ha tapos kon may nasisingit nga activity, naiinterupt an pagtutdo • Kaya kami kon diri pa familiar mostly an bata han lesson nabalik han mga basics kay makuri pagsulod han bag-o nga lesson kon diri hira maaram han mga prior learning.

Appendix

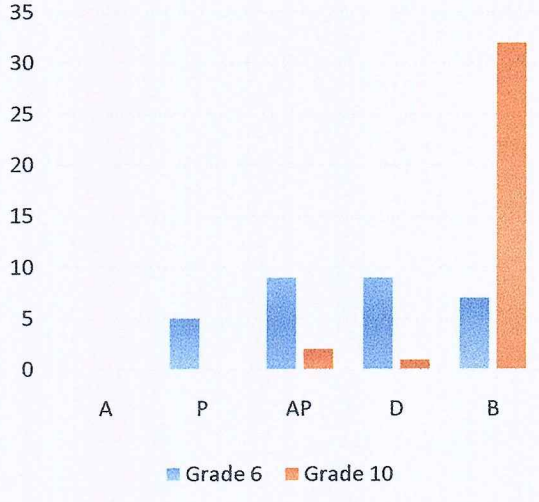
Proficiency Level of Grade 6 & Grade 10 Students



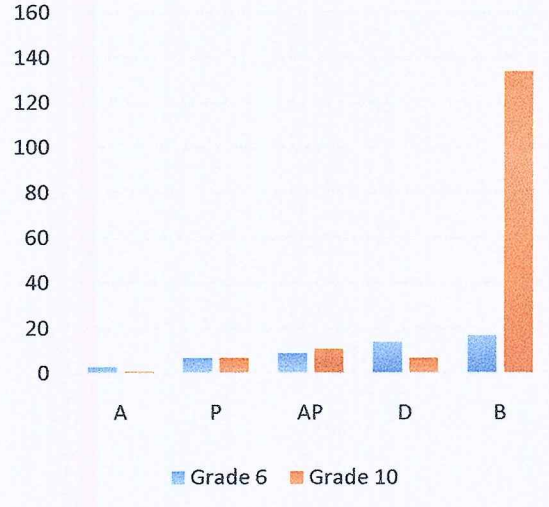
School A & School B



School C & School D



School E & School F



School G & School H

Legend:	
Advanced (A)	Above 90
Proficient (P)	85-89
App. Proficiency (AP)	80-84
Developing (D)	75-79
Beginning (B)	Below 75

Item Analysis in Proficiency Test for Grade 6

Item No.	CorrUG	CorrLG	Pug	Lug	Diff.Index	ItemEval	Dis.Index	ItemEval	Evaluation/Action
1	9	5	0.82	0.45	0.64	E	0.36	P	E, Improbable
2	6	2	0.55	0.18	0.36	D	0.36	GI	D, Improbable
3	5	6	0.45	0.55	0.5	MD	-0.1	P	MD, Discard
4	8	4	0.73	0.36	0.55	MD	0.36	GI	MD, Improbable
5	8	7	0.73	0.64	0.68	E	0.09	P	E, Discard
6	10	5	0.91	0.45	0.68	E	0.45	VGI	E, Retain
7	9	6	0.82	0.55	0.68	E	0.27	NI	E, Revise
8	8	3	0.73	0.27	0.5	MD	0.45	VGI	MD, Retain
9	5	2	0.45	0.18	0.32	D	0.27	NI	D, Revise
10	7	5	0.64	0.45	0.55	MD	0.18	P	MD, Discard
11	9	4	0.82	0.36	0.59	MD	0.45	VGI	MD, Retain
12	11	3	1	0.27	0.64	E	0.73	VGI	E, Retain
13	10	4	0.91	0.36	0.64	D	0.55	VGI	D, Retain
14	6	2	0.55	0.18	0.36	D	0.36	GI	D, Improbable
15	9	5	0.82	0.45	0.64	E	0.36	GI	E, Improbable
16	5	1	0.45	0.09	0.27	D	0.36	GI	D, Improbable
17	3	2	0.27	0.18	0.23	D	0.09	P	D, Discard
18	4	5	0.36	0.45	0.41	MD	-0.1	P	MD, Discard
19	9	4	0.82	0.36	0.59	MD	0.45	VGI	MD, Retain
20	7	4	0.64	0.36	0.5	MD	0.27	NI	MD, Revise
21	10	6	0.91	0.55	0.73	E	0.36	GI	E, Improbable
22	10	4	0.91	0.36	0.64	E	0.55	VGI	E, Retain
23	8	5	0.73	0.45	0.59	MD	0.27	NI	MD, Revise
24	6	2	0.55	0.18	0.36	D	0.36	GI	D, Improbable
25	4	4	0.36	0.36	0.36	D	0	P	D, Discard
26	9	5	0.82	0.45	0.64	E	0.36	GI	E, Improbable
27	11	5	1	0.45	0.73	E	0.55	VGI	E, Retain
28	7	4	0.64	0.36	0.5	MD	0.27	NI	MD, Revise
29	6	3	0.55	0.27	0.41	MD	0.27	NI	MD, Revise
30	8	4	0.73	0.36	0.55	MD	0.36	NI	MD, Improbable
31	7	4	0.64	0.36	0.5	MD	0.27	NI	MD, Revise
32	4	1	0.36	0.09	0.23	D	0.27	NI	D, Revise
33	9	2	0.82	0.18	0.5	MD	0.64	VGI	MD, Retain
34	8	3	0.73	0.27	0.5	MD	0.45	VGI	MD, Retain
35	11	7	1	0.64	0.82	E	0.36	GI	E, Improbable
36	4	2	0.36	0.18	0.27	D	0.18	P	D, Discard
37	10	4	0.91	0.36	0.64	E	0.55	VGI	E, Retain
38	6	6	0.55	0.55	0.55	MD	0	P	MD, Discard
39	10	3	0.91	0.27	0.59	MD	0.64	VGI	MD, Retain
40	10	5	0.91	0.45	0.68	E	0.45	VGI	E, Retain

41	9	5	0.82	0.45	0.64	E	0.36	GI	E, Improbable
42	4	6	0.36	0.55	0.45	MD	-0.2	P	MD, Discard
43	8	4	0.73	0.36	0.55	MD	0.36	NI	MD, Improbable
44	9	4	0.82	0.36	0.59	MD	0.45	VGI	MD, Retain
45	9	5	0.82	0.45	0.64	E	0.36	NI	MD, Revise
46	8	3	0.73	0.27	0.5	MD	0.45	VGI	MD, Retain
47	6	3	0.55	0.27	0.41	MD	0.27	NI	MD, Revise
48	9	4	0.82	0.36	0.59	MD	0.45	VGI	MD, Retain
49	9	5	0.82	0.45	0.64	E	0.36	GI	E, Improbable
50	9	4	0.82	0.36	0.59	MD	0.45	VGI	MD, Retain
51	9	3	0.82	0.27	0.55	MD	0.55	VGI	MD, Retain
52	4	1	0.36	0.09	0.23	D	0.27	NI	D, Revise
53	7	2	0.64	0.18	0.41	MD	0.45	VGI	MD, Retain
54	8	4	0.73	0.36	0.55	MD	0.36	GI	MD, Improbable
55	8	3	0.73	0.27	0.5	MD	0.45	VGI	MD, Retain
56	6	4	0.55	0.36	0.45	MD	0.18	P	MD, Discard
57	7	3	0.64	0.27	0.45	MD	0.36	GI	MD, Improbable
58	5	3	0.45	0.27	0.36	D	0.18	P	D, Discard
59	8	4	0.73	0.36	0.55	MD	0.36	GI	MD, Improbable
60	5	2	0.45	0.18	0.32	D	0.27	NI	D, Revise

DISCRIMINATION INDEX

0.40 and up	VI	Very Good Item
0.30 - 0.39	GI	Good Item but subject to improvement
0.20 - 0.29	NI	Needs Improvement
Below 0.19	PI	Poor Item/ To be Rejected

LEVEL OF DIFFICULTY:

0.00 - 0.20	VD	Very Difficult
0.21 - 0.40	D	Difficult
0.41 - 0.60	MD	Moderately Difficult
0.61 - 0.80	E	Easy
0.81 - 1.00	VE	Very Easy

Item Analysis in Proficiency Test for Grade 10

Item No.	CorrUG	CorrLG	Pug	Lug	Diff.Index	ItemEval	Dis.Index	ItemEval	Evaluation/Action
1	9	6	0.69	0.46	0.58	MD	0.23	NI	MD, Revise
2	6	2	0.46	0.15	0.31	D	0.31	GI	D, Improbable
3	5	6	0.38	0.46	0.42	MD	-0.1	P	MD, Discard
4	8	4	0.62	0.31	0.46	MD	0.31	GI	MD, Improbable
5	13	10	1	0.77	0.88	E	0.23	NI	E, Revise
6	10	5	0.77	0.38	0.58	MD	0.38	GI	MD, Improbable
7	9	6	0.69	0.46	0.58	MD	0.23	NI	MD, Revise
8	8	3	0.62	0.23	0.42	MD	0.38	GI	MD, Improbable
9	5	2	0.38	0.15	0.27	D	0.23	NI	D, Revise
10	7	5	0.54	0.38	0.46	MD	0.15	P	MD, Discard
11	9	4	0.69	0.31	0.5	MD	0.38	GI	MD, Improbable
12	11	3	0.85	0.23	0.54	MD	0.62	VGI	MD, Retain
13	10	4	0.77	0.31	0.54	MD	0.46	VGI	MD, Retain
14	6	2	0.46	0.15	0.31	D	0.31	GI	D, Improbable
15	12	5	0.92	0.38	0.65	E	0.54	VGI	E, Retain
16	5	1	0.38	0.08	0.23	D	0.31	GI	D, Improbable
17	9	2	0.69	0.15	0.42	MD	0.54	VGI	MD, Retain
18	10	5	0.77	0.38	0.58	MD	0.38	GI	MD, Improbable
19	9	4	0.69	0.31	0.5	MD	0.38	GI	MD, Improbable
20	7	4	0.54	0.31	0.42	MD	0.23	NI	MD, Revise
21	10	6	0.77	0.46	0.62	E	0.31	GI	E, Improbable
22	10	4	0.77	0.31	0.54	MD	0.46	VGI	MD, Retain
23	8	5	0.62	0.38	0.5	MD	0.23	NI	MD, Revise
24	9	2	0.69	0.15	0.42	MD	0.54	VGI	MD, Retain
25	7	8	0.54	0.62	0.58	MD	-0.1	P	MD, Revise
26	9	5	0.69	0.38	0.54	MD	0.31	GI	MD, Improbable
27	11	5	0.85	0.38	0.62	E	0.46	VGI	E, Retain
28	7	4	0.54	0.31	0.42	MD	0.23	NI	MD, Revise
29	11	3	0.85	0.23	0.54	MD	0.62	GI	MD, Improbable
30	8	4	0.62	0.31	0.46	MD	0.31	GI	MD, Improbable
31	7	4	0.54	0.31	0.42	MD	0.23	NI	MD, Revise
32	5	1	0.38	0.08	0.23	D	0.31	GI	D, Improbable
33	9	11	0.69	0.85	0.77	E	-0.2	P	E, Discard
34	8	3	0.62	0.23	0.42	MD	0.38	GI	MD, Improbable
35	11	7	0.85	0.54	0.69	E	0.31	GI	E, Improbable
36	8	2	0.62	0.15	0.38	D	0.46	VGI	D, Retain
37	10	4	0.77	0.31	0.54	MD	0.46	VGI	MD, Retain
38	11	6	0.85	0.46	0.65	E	0.38	GI	E, Improbable
39	10	3	0.77	0.23	0.5	MD	0.54	VGI	MD, Retain
40	10	11	0.77	0.85	0.81	E	-0.1	P	E, Discard
41	9	5	0.69	0.38	0.54	MD	0.31	GI	MD, Improbable
42	8	8	0.62	0.62	0.62	E	0	P	E, Discard
43	8	9	0.62	0.69	0.65	E	-0.1	P	E, Discard
44	8	4	0.62	0.31	0.46	MD	0.31	GI	MD, Improbable
45	11	8	0.85	0.62	0.73	E	0.23	NI	E, Revise
46	9	3	0.69	0.23	0.46	MD	0.46	VGI	MD, Retain
47	11	4	0.85	0.31	0.58	MD	0.54	VGI	MD, Retain
48	9	4	0.69	0.31	0.5	MD	0.38	GI	MD, Improbable
49	10	5	0.77	0.38	0.58	MD	0.38	GI	MD, Improbable
50	9	7	0.69	0.54	0.62	E	0.15	P	E, Discard

51	12	7	0.92	0.54	0.73	E	0.38	GI	E, Improbable
52	7	1	0.54	0.08	0.31	D	0.46	VGI	D, Retain
53	7	2	0.54	0.15	0.35	D	0.38	GI	D, Improbable
54	9	6	0.69	0.46	0.58	MD	0.23	NI	MD, Revise
55	9	10	0.69	0.77	0.73	E	-0.1	P	E, Discard
56	10	4	0.77	0.31	0.54	MD	0.46	VGI	MD, Retain
57	12	3	0.92	0.23	0.58	MD	0.69	VGI	MD, Retain
58	11	3	0.85	0.23	0.54	MD	0.62	VGI	MD, Retain
59	8	10	0.62	0.77	0.69	E	-0.2	P	E, Discard
60	8	2	0.62	0.15	0.38	D	0.46	VGI	D, Retain

DISCRIMINATION INDEX

0.40 and up	VI	Very Good Item
0.30 - 0.39	GI	Good Item but subject to improvement
0.20 - 0.29	NI	Needs Improvement
Below 0.19	PI	Poor Item/ To be Rejected

LEVEL OF DIFFICULTY:

0.00 - 0.20	VD	Very Difficult
0.21 - 0.40	D	Difficult
0.41 - 0.60	MD	Moderately Difficult
0.61 - 0.80	E	Easy
0.81 - 1.00	VE	Very Easy

CURRICULUM VITAE

CURRICULUM VITAE

PERSONAL DATA

NAME	:	Ma. Emalyn Anacio-Uy
DATE OF BIRTH	:	March 28, 1991
ADDRESS	:	P-2 Brgy. Socorro Catbalogan City
CIVIL STATUS	:	Single
FATHER	:	Vicente Mesa Uy Jr
MOTHER	:	Elena Anacio-Uy
SIBLINGS	:	Evelyn Uy-Lopez Elvie A. Uy Erwin A. Uy Eric A. Uy Ervin A. Uy

EDUCATIONAL ATTAINMENT

ELEMENTARY	:	Catbalogan I Central Elementary School Catbalogan City (1997-2003)
SECONDARY	:	Samar National School Catbalogan City (2003-2007)
COLLEGE	:	Bachelor of Secondary Education, Major in Mathematics Samar State University Catbalogan City (2007-2011)

GRADUATE	:	Master of Arts in Teaching Major in Mathematics Samar State University Catbalogan City 2014-
ELIGIBILITY	:	Professional Teacher March 12, 2012
WORK EXPERIENCE:		Substitute Teacher July 2011-September 2011 Wright National High School Paranas, Samar High School Teacher June 2012-March 2013 St. Michael's High School Gandara, Samar Secondary School Teacher I May 2013-present Casandig National High School Paranas, Samar

LIST OF TABLES

LIST OF TABLES

LIST OF FIGURES

LIST OF FIGURES