Elementary Mathematics Education Curriculum of Japan and the Philippines

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Abstract

Mathematics is a very important subject in basic education. A well-structured mathematics curriculum is necessary in enhancing the capabilities of every student. In this paper, the researchers compare the elementary mathematics curriculum of Japan and the Philippines. The similarities and the differences in the different learning objectives in each grade level are compared. The time allotted for teaching mathematics and the mathematics textbooks used in the classroom are also briefly discussed. Through this comparison, the positive and the negative attributes of the curriculum of each country will be identified and improved. And the strong points in each curriculum can be probably adopted for the enhancement of mathematics education in each country.

Key words: time allotment, learning objectives, mathematics curriculum, textbooks

I. Introduction

The school system of Japan is consisted of six-year elementary schools, three-year junior high schools, three-year high schools and four-year universities. Education is compulsory and free for all schoolchildren from elementary to junior high school.

On the other hand, educational system in the Philippines is composed of six-year elementary level, four-year secondary level and four or five-year tertiary level. The basic education is free and compulsory in elementary level and free only in secondary level.

In both countries, children start going to elementary school at age six. Almost 100 percent of the children in the two countries enter Grade 1. However, the transition rate from elementary level to high school level in the Philippines is about 70 percent while in Japan it is also almost 100 percent.

In order to promote and enhance the basic education, the Department of Education in the Philippines and the Elementary and Secondary Education Bureau of the Ministry of Education in Japan are responsible in establishing curriculum standards in all levels of education except the tertiary levels.

In the Philippines, the curriculum development in the elementary education is the responsibility of the Bureau of Elementary Education, Curriculum Division at the Central Office. The bureau defines the learning competencies for the different subject areas, conceptualize the structure of the curriculum and formulate national curricular policies. These functions are exercised in consultation with other agencies and sectors of society such as industry, socio-civic groups, teacher training institutions, professional organizations, school administrators, parents, students, and other stakeholders. The subject offerings, credit points, grading system and time allotments for the different subject areas are determined at the national level. In this sense, there exists in the Philippines a national curriculum. Schools, however, are given the option to make modifications/adaptations on the curriculum to ensure that the curriculum responds to local concerns.

The task of preparing the content of the curriculum in Japan is the collaboration of the Ministry of Education, Science and Culture, the board of education and each school. However, the bulk of planning falls on the hand of the school, which is directly involve in education. Therefore the final responsibility is shouldered by the principal of each school with the cooperation of

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all the teaching staff in the school. The curriculum is designed based on the present Course of Study and regulations as prescribed by the Education Law, the actual conditions of the community, and the developmental stages and characteristics of the students.

For the past decades various reforms have been made to upgrade the basic education in the two countries. The latest reforms in enhancing the elementary and secondary levels of education in both countries were implemented almost at the same time. The 2002 Basic Education Curriculum of the Philippines has started in the SY 2003-2004. On the other hand, the newest revision for the Courses of Study in Japan was in 2002. These new curricula aim to equip the students with the skills and knowledge that are necessary in today's society.

Under the Basic Education Curriculum, the goal of the Philippine Elementary Mathematics Curriculum is stated as follows: "demonstrate understanding and skills in computing with considerable speed and accuracy, estimating, communicating, thinking analytically and critically, and in solving problems in daily life using appropriate technology."

On the other hand, Japan's present curriculum in mathematics is revised in 2002 with the goal of:

"through mathematical activities concerning numbers, quantities and geometrical figures, children should get basic knowledge and skills, should get abilities to think logically and to think with good perspectives, should notice the pleasure of doing activities and appreciate the value of mathematical methods, and should get attitudes to

make use of mathematics in daily life situations."

The curricular goals of the two countries in elementary mathematics education are almost similar. They both seek to provide the students with different and varied experiences that will enhance their ability to think logically and creatively using mathematical problems that are based in real life situations.

II. Time Allotment

As shown in Table 1, in the Philippines, there are 200 days or 40 weeks per school year while in Japan there are 34 or 35 weeks in one school year. Mathematics is taught for 60 or 70 minutes per day in the Philippines but in Japan, it is taught 45 minutes per class period four or five times a week.

In Japanese classes, there is a 10-minute break in between class periods but in the Philippines there is none. The Filipino pupils are only given a 20 or 30-minute break or recess time in between the whole class hours. From the figures given above, the Philippines has greater teaching/learning time in mathematics than in Japan. In Grade I, the Filipino pupils spent

Table 1
Time Allocation for Mathematics in Elementary Level in Japan and the Philippines

	Japan			Philippines	
Grade	Age (years old)	Standard time of a class period in mathematics	Standard number of class periods per year and per week for mathematics (year/week)	Standard time of a class period in mathematics	Standard number of class periods per year and per week for mathematics (year/week)
1	6	45 min	114/3-4	70 min	200/5
2	7	45 min	155/4-5	70 min	200/5
3	8	45 min	150/4-5	70 min	200/5
4	9	45 min	150/4-5	60 min	200/5
5	10	45 min	150/4-5	60 min	200/5
6	11	45 min	150/4-5	60 min	200/5

almost twice than their counterparts in Japan in studying mathematics in one school year.

The mathematics performance of Filipino students in national achievement as well as the international achievement has been consistently low so to improve mathematics education, one solution is to increase the time allotment given to mathematics.

III. Learning Objectives

The curriculum design for the learning objectives in elementary mathematics in the Philippines is content-based and competency-based. The school children are expected to master a list of competencies at the end of each school year and at the end of elementary level. The content is also arranged in increasing complexity from Grade 1 to Grade 6.

In Japan, the main feature of the mathematics curriculum elementary is the introduction of mathematical activities. Its goal is to provide enjoyment for elementary pupils as they learn the concepts and skills in mathematics. The objectives and content in each grade level are also arranged in hierarchical order.

Tables 2 to 7 show the mathematics learning objectives in Japan and in the Philippines from Grade 1 until Grade 6. Since mathematics is universal, most of the objectives in the Philippines and Japan are similar. However, the learning objectives in elementary mathematics in the Philippines are more compared to Japan. Some of the objectives are taught in Japanese schools in junior or senior high schools. Probably, one of the reasons why the Philippine elementary curriculum is too many is because the basic education is shorter compared to many countries in the world like Japan. The Filipino students should learn as much as possible in elementary in order to cope up with the lessons in high school.

Table 2
Grade 1 Mathematics Objectives

	Philippines	Japan
Whole Numbers	- Identify, classify common objects as to their color, thickness, size and shape - Identify the place value of 1-2 digit numbers - Read and write numbers up to 100 - Read and write ordinal numbers from 1-10 - Read and write money up to P50.00	- Understand the meaning of numbers from 1 to 100 - Count, represent, compare, and order numbers using concrete materials and in figures correctly - Divide, organize and express numbers into equal quantities
Addition of Whole Numbers	- Add 1-2 digit numbers with sum up to 99 with or without regrouping - Illustrate identity and commutative properties of addition - Solve word problems	- Understand the meaning of addition - Identify situations where addition is used - Read and write addition sentences correctly - Add two one-digit numbers
Subtraction of Whole Numbers	- Visualize subtraction - Subtract 1-2 digit numbers from 1-2 digit numbers with or without regrouping - Solve 1 - step word problems	- Understand the meaning of subtraction - Identify situations where subtraction is used - Read and write subtraction sentences correctly - Subtract two one-digit numbers
Fractions	- Identify 1/2 and 1/4 of a whole	
Measurement	- Time Measure (days in a week; months in a year; minutes; hour, half hour, quarter of an hour) - Measure linear objects, mass, area and capacity using non-standard units of measure	- Compare the lengths directly - Compare the lengths of other objects in terms of multiples of the unit
Geometry		- Recognize the shape of objects and grasp the characteristics of the shape - Express the positions of things, using the words relating to direction and position such as "before and behind", "left and right", "above and below", etc.

Table 3
Grade 2 Mathematics Objectives

	Philippines	Japan
Whole Numbers	- Identify, read and write numbers up to 1,000 - Compare numbers using >, <, = - Read and write ordinal numbers from 11th-20th, 21st and so on. - Express Roman numbers in Hindu-Arabic numbers and vice-versa	- Count objects by rearranging or by classifying them into groups of the same size - Represent numbers up to 4-digit numbers using the Hindu-Arabic system - Understand the size and order of numbers
Addition of Whole Numbers	- Add 2 to 3-digit numbers with sum up to 999 with or without regrouping - Show commutative and associative properties of addition - Analyze and solve word problems	- Add 2-3-digit numbers with 2 addends - Understand the relationship and properties of addition and subtraction
Subtraction of Whole Numbers	- Subtract 2 to 3-digit numbers with minuends up to 999 with or without regrouping - Mental computation - Solve 1 to 2-step word problems	- Subtract 2 to 3-digit numbers
Multiplication of Whole Numbers	- Multiply 1 to 2-digit by 1-digit numbers with products up to 81 - Give the factors of a given number - Solve 1 to 2-step word problems	- Meaning and properties of multiplication - Know and use the multiplication table properly - Multiply 1-digit numbers with products up to 81
Division of Whole Numbers	- Illustrate division - Identify parts of a division sentence - Divide 1 to 2-digit by 1-digit divisor without remainder - Solve 1 to 2-step word problems	
Fractions	- Identify 1/3, 1/5, 1/6 - Compare fractions	
Geometry	- Identify, classify, describe triangles, squares and rectangles - Tessellate a surface using triangles and other shapes - Identify symmetry in a figure	- Construct, analyze, and identify the characteristics of various shapes - Identify, draw and construct triangles, squares, etc.
Measurement	- Time Measure (days, weeks, months, year; digital clock; word problems) - Measure length, mass and capacity using standard units; converts units to lower or higher units - Find the area of squares and rectangles	- Read clock correctly - Know and understand the meaning of measurement and the units of measurement for length (mm, cm, m)

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Table 4
Grade 3 Mathematics Objectives

	Philippines	Japan
Whole Numbers	- Identify, read and write numbers up to 100,000 - Compare numbers using >, <, = - Read and write money through P1,000 - Round off numbers - Identify odd and even numbers - Express Roman numbers to Hindu-Arabic numbers and vice-versa	- Understand numbers up to 10,000 - Represent numbers on an abacus
Addition of Whole Numbers	- Add 4 to 5-digit numbers up to four addends with or without regrouping - Show zero and identity properties of addition - Estimate the sum - Solve word problems	- Add 3-digit numbers with two addends - Understand the properties of addition and subtraction and its relation to multiplication - Add numbers using abacus
Subtraction of Whole Numbers	- Subtract 3 to 4-digit numbers from 4 -5 digit numbers with or without regrouping - Estimate the difference - Solve 1 to 2-step word problems	- Subtract 3-digit numbers - Subtract numbers using abacus
Multiplication of Whole Numbers	- Multiply 2 to 4-digit by 1 to 2-digit numbers - Show commutative and associative properties of multiplication - Estimate the product - Solve 1 to 2-step word problems	- Investigate the properties of multiplication and apply them appropriately - Multiply 2 to 3 by 1-digit, 2 by 2-digit numbers
Division of Whole Numbers	- Divide 2-4 digit by 1-2 digit numbers with or without remainder - Estimate the quotient - Solve 1 to 3-step word problems	- Understand the meaning of division and remainders - Understand the relationship of division to multiplication and subtraction - Divide 1-digit by 1-digit numbers
Fractions	- Identify proper, improper, and mixed fractions - Order fractions - Change fractions to lowest terms - Find the greatest common factor - Find the fractional part of a set	
Geometry	- Visualize and identify perpendicular, parallel, and intersecting lines - Draw congruent line segments - Determine which motion creates a given tessellation - Make simple symmetrical designs	- Draw and construct rectangles, squares, right-angled triangles - Lay solids out flat on a plane
Measurement	- Convert time measurement from smaller to larger units and vice-versa such as days to hours - Find the area of squares and rectangles - Find the capacity using the standard units of measure	- Understand the relationship between days, hours, minutes and seconds - Find the time and time required - Know the units of length, capacity, and weight - Understand the meaning of the units of volume and weights and their measurements
Graph	- Interpret and construct pictograph	- Read and draw bar graphs - Classify and organize data and summarize them in tables
Calculator	- Identify the parts and functions of a calculator	

Table 5
Grade 4 Mathematics Objectives

	Philippines	Japan
Whole Numbers	- Identify, read and write numbers through billions - Round off numbers	- Know the units 100 million and one trillion - Round off numbers and apply them appropriately in certain situations
Addition of Whole Numbers	- Add 6- or more digit numbers with 4- or more addends with or without regrouping - Estimate the sum - Solve word problems	- Understand and calculate mix expressions in brackets or parentheses properly involving the four fundamental operations
Subtraction of Whole Numbers	- Subtract 5- or more digit numbers from 6- or more digit numbers with or without regrouping - Estimate the difference - Solve 1 to 2-step word problems	
Multiplication of Whole Numbers	- Show zero, identity and distributive properties of multiplication - Multiply 5- or more digit by 3 to 5-digit numbers with or without regrouping - Estimate the product - Write numbers in exponential form and scientific notation - Solve 1 or 2-step word problems	
Division of Whole Numbers	- Divide 5- or more digit by 3- or more digit numbers with or without remainder - Estimate the quotient - Solve 1 to 3-step word problems	- Divide 2 to 3-digit by 1 to 2-digit divisors - Investigate the relations among dividend, divisor, quotient and remainder - Investigate the properties of division and its relationship to multiplication - Apply division appropriately to situations
Fractions	- Identify proper, improper and mixed fractions - Identify similar and dissimilar fractions - Order similar fractions - Change improper fractions to mixed numbers - Rename decimals to fractions - Add or subtract similar fractions - Solve word problems involving addition and subtraction of fractions - Visualize multiplication of fractions and find a fractional part of a number - Multiply a fraction by another fraction - Solve word problems	- Understand the meaning of fractions and how to express them - Use fractions to express remainders and the size of the proportion that can be divided equally - Identify proper, improper and mixed fractions
Decimals	- Read and write decimals through hundredths - Round decimals - Add and subtract decimals through hundredths - Solve word problems	- Understand the meaning and how to express decimals down to the one-tenths position - Add and subtract decimals up to tenths
Geometry	- Identify the different kinds and parts of - an angle - a triangle - a quadrilateral - Identify and construct plane figures - Identify congruent angles	- Draw, construct, tessellate and give the properties of isosceles and equilateral triangles - Know the angles of basic geometrical figures - Know the properties and parts of a circle and be able to draw and create circles
Measurement	- Find the perimeter of polygons - Find the area of triangles and parallelograms - Use non-standard units to measure volume	- Understand the meaning of unit and measurement of area - Find the area of square and rectangle - Size and unit of angles - Measure angles
Graph	- Read, interpret and construct a bar graph	- Read, interpret and construct line graph

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Table 6
Grade 5 Mathematics Objectives

	Philippines	Japan
Whole Numbers	- Review whole numbers and the basic operations, word problems, odd or even numbers, LCM - Differentiate prime and composite numbers - Tell when a number is divisible by another number	- Classify odd and even numbers - Estimate the sum or difference
Fractions	- Change dissimilar to similar fractions - Order dissimilar fractions - Add and subtract similar and dissimilar fractions without and with regrouping - Visualize multiplication of fractions - Multiply fractions - Solve 1 to 2-step word problems	- Change whole numbers and decimals to fractions - Identify equivalent fractions - Add and subtract similar fractions - Create and investigate numbers 10 times, 100 times, 1/10 and 1/100 the size of a number
Ratio and Proportion	- Visualize and express ratio - Reduce ratio to lowest terms - Form proportion	-
Decimals	- Read and write decimals through thousandths - Add and subtract decimals through thousandths without or with regrouping - Multiply decimals - Divide decimals through hundredths - Solve 1 to 2-step word problems	- Relate multiplication of decimals to whole numbers - Multiply and divide whole numbers by decimals - Multiply and divide decimals
Percent	- Visualize the meaning of percent - Relate fractions, decimals, ratios and percent	- Understand the meaning of percentage
Geometry	- Draw 5-or more sided polygons - Visualize circle and identify its parts - Identify congruent and similar polygons	- Understand the relationship between parallel and perpendicular lines - Find simple characteristics of basic geometrical figures and be able to use and construct them - Draw, construct, tessellate parallelograms, rhombuses, and trapezoids - Understand the meaning of the ratio of the circumference of a circle to its diameter - Find the sum of the angles of polygons
Measurement	- Find the circumference of a circle - Find the area of trapezoids and circles - Find the volume of a cube and rectangular prism - Identify the parts and read a thermometer	- Find the area of triangle and parallelogram - Find the area of circles
Graph	- Read, interpret, and construct a line graph	- Classify and organize data into circle graphs

Table 7
Grade 6 Mathematics Objectives

	Philippines	Japan
Whole Numbers	- Give the meaning of expression, equation, exponent and base - Evaluate expression following the correct order of operations (PEMDAS)	- Know about factors and multiples - Estimate product and quotient - Find the greatest common divisors and least common multiples
Decimals	- Visualize decimals - Read and write decimals through ten thousandths - Add and subtract decimals and mixed decimals through ten thousandths - Estimate sums and differences - Multiply decimals and mixed decimals through thousandths without and with regrouping and with zero difficulty - Divide decimals and mixed decimals up to 2-digit divisors - Solve 1 to 3-step word problems	- Multiply and divide decimals
Fractions	- Form equivalent fractions - Rename decimals as fractions and vice versa - Change fractions to lowest terms - Add and subtract similar and dissimilar fractions without or with regrouping - Multiply and divide fractions and mixed fractions - Solve 1 to 3-step word problems	- Understand the equivalence and size of fractions - Compare fractions - Add and subtract dissimilar fractions - Understand that a given fraction multiplied and divided by the same number has the same size as the given fraction - Multiply and divide fractions
Ratio and Proportion	- Form ratio and proportion - Solve word problems with direct proportion, partitive proportion, inverse proportion	- Compare and express the ratio of two different quantities - Understand the meaning of proportion
Percent	- Identify and find the percentage, rate and base - Find percent of increase/decrease, commission, sales tax, simple interest	
Simple Probability	- Make simple predictions - Tell the number of favorable outcomes	
Integers	- Visualize, compare and order integers	
Geometry	- Describe and draw spatial figures	- Understand cubes and rectangular parallelepipeds - Understand the relationship between parallel and perpendicularity of lines and planes - Know cylinders and prisms
Measurement	- Find the surface area of cubes, rectangular prisms and cylinders - Find the volume of prism, cylinder, pyramid, cone	- Find the approximate area of geometrical shapes found nearby - Understand and know the meaning of units and measurement for volume - Find the volume of a cube and a rectangular parallelepiped - Express and find the velocity of something
Meter Reading	- Read and interpret readings from 　- Electric Meter 　- Water Meter	
Graph	- Read, interpret and construct a circle graph	

The children in Japan and the Philippines enter the elementary school at age six. Even though, kindergarten is optional, most children in Japan undergo the preparatory level of schooling. However, in the Philippines, majority of the children entered school without having the opportunity of going to pre-school. Because of this, the eight-week curriculum or early childhood experiences for Grade 1 is implemented starting 1995. The lessons are carefully sequenced and prepared so that the pupils could gradually move to the Grade 1 curriculum. In order to help the pupils smoothly transfer from the preparatory lessons to Grade 1 mathematics curriculum, the grade one lessons start from identifying and classifying the color, size, shape, and thickness of the common objects that are found in the home and the community. These activities will enable the pupils to familiarize about the things that are found in the environment that have relationship with numbers. It will also help them develop their dexterity in writing.

On the other hand, in Japan schools, grade I mathematics class starts immediately in counting numbers. The teacher slowly and clearly builds up the meaning and concept of each number. The students do not only learn how many objects, things, or other counters that composed a number but also what other numbers made up that given number. For example, Japanese Grade 1 pupils learn that 5 is made up of 1 and 4, 2 and 3, 3 and 2, and 4 and 1 without still learning the concept of addition. In the Philippines, this concept is only introduced in learning addition.

In learning the concept of whole numbers the students in both countries study them from grade 1 up to grade 4 with the value and place value of the numbers increasing each year. But in the Philippines these concepts are again reviewed in Grades 5 and 6 while in Japan they are already interrelated with decimals and fractions. The Filipino students have also lots of practice and exercises in reading and writing the numbers in words and in figures but in Japanese schools, they only focus on writing the numbers in figures. Although Japanese students learn numbers as large as one trillion, they only manipulate small numbers when solving problems involving the four fundamental operations. On the other hand, Filipino pupils should also solve numbers as large as the place value they have learned for that grade level. Solving expressions that involve

three or more operations with brackets or parentheses are taught specifically in Grade 6 in the Philippines but in Japan the students learn them as soon as they study the different concepts of the four fundamental operations.

In the Philippines, as early as grade 1, the relation symbols >, <, and = are already used in comparing numbers but in Japan these symbols are introduced in middle high school.

The language of instruction in mathematics in the Philippines is English while in Japan it is the same as their native language, which is Nihongo. Most Filipino children enter the school for the first time without any knowledge of English. They have to learn simultaneously the language of mathematics and English which is difficult to some students. To minimize the difficulty encountered by the students especially in solving word problems, the math classes in the Philippines follow the same format in solving problems from grade 1 up to grade 6. The standard format is: what is asked?, what are the given facts?, what are the operation to be used?, what is the number sentence?, and lastly find the solution and label the answer correctly. However, the teachers are encouraged to vary the words used in the questions so that pupils will know the different ways the same question can be stated. Thus, it will build up their mathematical comprehension skills and the ability to solve problems accurately and appropriately.

Fractions are studied in the Philippines little by little starting from basic unit fractions such as 1/2 and 1/4 in grade 1. The lessons gradually increase in difficulty in every grade level until they learn to solve problems involving the basic operations in fractions. In Japan, fractions are taught starting in Grade 4 and also after the pupils studied decimals. The Japanese pupils should see the relationship of fractions to decimals and to whole numbers. Just like in whole numbers, Japanese students solve smaller value of fractions in the operations of the four fundamentals including word problems compared to the Filipino students.

The study of decimals starts in Grade 4 in both countries. The writing is similar but the way of reading them is totally different. For example in reading the decimal number 3.1569. In the Philippines, it is read as three and one thousand five hundred sixty-nine ten thousandths. The whole number is read first then the

decimal point is read as "and" and then the digits after the decimal point is read as whole numbers except that at the end the place value of the last digit of the decimal number is added. In Japan, it is read as "san ten ichi, go, roku, kyu or translated as three point one, five six, nine. The method of reading decimal numbers in Japan is easier than in the Philippines. The Japanese pupils do not have difficulty in identifying which place value is missing and needs zero as a placeholder since all the digits are read. Although this method of reading is not allowed in elementary grades in the Philippines, it is often used in secondary and tertiary levels.

Geometry in Japanese schools is more practical than in Filipino schools. Japanese pupils are encouraged to investigate the different characteristics of the basic plane and solid figures. They must also be able to draw and construct these figures and to see the relationships among them. Although, Filipino pupils also construct some geometrical figures, they deal more on identifying and classifying these figures.

In Japan, measurement lessons are focused on the different standards of unit of measure in length, mass, capacity, area and volume. Japanese students are encouraged to have varied experiences in measuring objects and figures that are found in their environment. In contrast, the Filipino students first study the non-standard unit of measure and afterwards study the standard units of measure in length, mass, and the like. The Filipino students must be able to distinguish which unit of measure is accurate and consistent and appropriate in certain object or problem situations. The topic on temperature measure is also included in the Philippine curriculum. In Japan, however, there is no specific lesson about it but it is already embedded in other lessons such as tables and graphs. It is assumed that since weather thermometers are very common in most homes and establishments in Japan because of the varying degrees in temperature, so most of the students are already familiar in the use of these instruments. But in the Philippines, body or weather thermometers are not very common in the homes of most Filipinos hence, it is a novel experience for the pupils to learn and probably have a hands-on experience in using these instruments.

Lastly, there are objectives in the Philippine curriculum that are new under the Basic Education Curriculum. These include the basic concepts about nega-

tive numbers or integers, simple probability of an event, and partitive and inverse proportions. These topics are not yet studied in elementary level in Japan but in high school.

IV. Textbooks

The textbooks used in the public schools in the Philippines are approved by the Department of Education. The Department is also responsible in procuring textbooks to all public schools so that every child has the chance to use these books for their studies. Private schools in the Philippines choose their own textbooks. In Japan, the Ministry of Education also approved the textbooks to be used in public schools. However, the local boards of education in public schools decide which textbooks are appropriate for their students. Textbooks are free in elementary and junior high school in public schools. The textbooks in the Philippines should be used and revised at least every five years while in Japan every three or four years.

The mathematics textbooks in Japan use real pictures of places, things and other objects that have relationship with the content or the lessons presented in the book. The textbooks are colorful and have lots of pictures and drawings. The examples and the exercises are illustrated so pupils have easier time to understand the lessons. There are also many activities that pertain to hands on activities. However, they are thinner and have lesser practice exercises than the Philippine textbooks.

The textbooks in the Philippines are monochromatic. They have many exercises on basic computation. Despite the fact that the revised mathematics curriculum has been implemented in 2003, there are still no new textbooks in mathematics. The teachers and students still use the old textbooks. Although, some of the lessons and exercises are the same there are also new lessons and topics that are included in each grade level. In order to fill up the deficiencies in the textbooks, the teachers do their best to look for the appropriate activities and materials for these lessons.

V. Conclusion

In the Philippines, whole numbers and the four fundamental operations are studied from Grade 1 up to Grade 5. It is only in Grade 6 that the students evaluate expressions with 3 or more operations following the

correct order of operations. On the other hand, Japanese students study them until Grade 4 and in the higher levels they are integrated in other lessons such as decimals and fractions. The operations are also interrelated as they learn the concept of each basic operation step by step. In calculating numbers, Filipino schools use larger numbers than the Japanese schools. The Philippine schools also follow a certain format in analyzing and solving problems but in Japan the students have the freedom to solve the problems in any way that seems appropriate for the given problem.

Fractions are taught starting from Grade 4 in Japan but in the Philippines, fractions are taught little by little from Grade 1 onwards. Just like in whole numbers, the Filipino students also solve larger fractions than Japanese Students. Decimals are introduced in both countries in Grade 4. However, decimals are taught first in Japan before fractions. The students should learn the concepts of decimals thoroughly so that they can be able to relate them in their study of fractions. In the Philippines, since Filipino students have already some background regarding fractions, the teacher have the option to choose which lesson should the students study first, decimals or fractions. It is also up to the teacher to show the relationship of these two topics.

There are some objectives in the Philippine curriculum that are not yet studied in elementary in Japan but they are studied fully in junior high school and high school. These objectives include prime numbers, exponents, the use of relation symbols >, <, and =, symmetry, negative integers and others. There are also some objectives which are present in Philippine curriculum but not in Japan such as Roman numbers, temperature measure and water and electric meter readings. There are also lessons in Japan that is not emphasized in Philippine elementary schools like the use of abacus and velocity.

In general, the learning objectives and the time allotment in elementary mathematics in the Philippines is more than the time and objectives prescribed in Japan. The Filipino students also learn some of the topics one or more grade levels earlier than Japanese students. It seems that the elementary mathematics curriculum in the Philippines is more difficult because the pupils must absorbed many skills and concepts compared to Japan. The Philippine elementary mathematics curriculum might be too many but since the concepts and skills to be developed are basic they are important for the students as they deal with daily life situations that require mathematical knowledge. It will also prepare them for higher learning as they go to the next level of education. However, because there are many objectives to finish per school year in every grade level, there is the tendency for teachers to teach the lessons very fast, so some of the students are not able to cope up with the lessons and they remained left behind.

On the other hand, the elementary mathematics curriculum of Japan has fewer learning objectives than the Philippines so most of the Japanese students have enough time to absorb and comprehend each lesson. They even have ample time to do hands-on activities and other fun-filled but stimulating activities in learning mathematics. The Japanese elementary students might be learning mathematics slower than Filipino students but since they have longer basic education, they could learn the other topics in high school. In the meantime, in elementary level, Japanese students are learning to enjoy mathematics and have the ability to relate their lessons in real-life situations.

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