Mapping of Philippine Kto10 Most Essential Learning Competencies (MELCs) in Probability and Statistics

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ABSTRACT

The complexity of Probability and Statistics Education was intensified by several concerns in the education sector brought by COVID-19 contagion. This study examined the Philippine Kto10 Most Essential Learning Competencies (MELCs) in Probability and Statistics by comparing the content topics and learning competencies with the Kto10 Mathematics Curriculum. This Critical-Qualitative approach of study used curriculum mapping as a method of analysis in the identification of the gaps in the MELCs across the grade level along with lesson continuity and lesson congestion backed up with the experiences and responses of 12-Math teachers (5 Elementary,7 Secondary) who were informants of the study. This investigation found out that the learning competencies in Probability and Statistics of the Kto10 Mathematics Curriculum were reduced (from 89 to 66 learning competencies) across grade level to cope up with the present educational crisis brought by the pandemic. The issuance of Most Essential Learning Competencies (MELCs) arranged in increasing complexity was seen as a good initiative in decongesting the overcrowded Kto10 Mathematics Curriculum. However, gaps were still seen along lesson continuity across grade level particularly in grade 9 (no lesson in Probability and Statistics). This study provides insights among educational authorities and researchers to further explore how the Probability and Statistics are taught across grade level. It uncovers the gaps along lesson continuity and congestion for the need of revision of Philippine Kto10 Mathematics Curriculum.

Keywords – Kto10 Mathematics Curriculum, Most Essential Learning Competencies (MELCs), Probability and Statistics, Curriculum mapping, New Normal Education

INTRODUCTION

Probability and Statistics as a content area of mathematics are facing with various challenges in the 21st century teaching and learning among basic education. The national educational system reforms, rapidly changing global standards, breakthroughs in information and communication technology (ICT), and the dynamic nature of the subject statistics were identified as causing challenges [1] have been strengthened by the Corona Virus Disease 2019 (COVID-19) Pandemic worldwide.

Prior to the emergence of the pandemic, Statistics was one of the important areas of mathematics already faced with global issues and concerns. Learning and instruction statistics issues were compiled and divided into three categories by [20]. These issues were also backed by and traceable to numerous pertinent studies conducted around the world. One of these is the teaching and learning of statistics as a discipline, which has been linked to problems like statistics anxiety, a bad attitude toward statistics, the

fact that probability and statistics are extremely challenging for students to learn, and the fact that statistics courses are frequently taught in isolation from other subject areas.

Among the problems enumerated, there are unlisted factors that greatly affect Statistics instruction and learning that must be addressed by the education sector [17]. According to the study of [3], identified professional development of teachers, overcrowded curriculum, unavailability or lack of instructional materials, and teaching and learning of mathematics as issues and concerns in the implementation of the Kto10 Mathematics Education in the Philippines.

The identified issues of the Philippine Kto10 Mathematics Curriculum can be strengthened by the investigation conducted by [10] emphasizing the need for revision of the Kto10 Mathematics curriculum due to congested content and learning competencies, unrealistic to implement. The study article emphasized the significance of carefully arranging content topics and learning competencies in the approach of spiral progression from Kindergarten to Grade 10 level. The Philippine Kto10 Probability and Statistics spiraling approach is designed for the fourth quarter (except in Grade 9) of every grade level which is not usually tackled due to the inclusion of numerous topics.

With the dawn of COVID 19, the Philippines' Department of Education's Bureau of Curriculum Development accelerated the identification of essential learning competencies and rationalized this into the Most Essential Learning Competencies (MELCs) extracted from the Kto10 Mathematics Curriculum [8][15]. Some of the learning competencies were removed, retained, and merged to simplify the congested curriculum and to cope up with the unexpected crisis that the pandemic had brought in the field of education aiming to cover all the identified competencies within a year [7].

Furthermore, the Philippine DepEd's Undersecretary for Curriculum and Instruction issued a memorandum proposing strategies for implementing Distance Learning Delivery Modalities (DLDM) for the 2020-2021 school year. Modular Distance Learning (MDL), Online Distance Learning (ODL), T-Video/Radio-Based Instruction (TV-Video/RBI), and Blended Distance Learning (BDL) were identified as the four modalities [19]. The goal of implementing these learning modalities was to reduce the risk of contagion in in-person classes. As a result, the so-called New Normal of Education has emerged [9].

Given the suggested distance learning modalities by the Philippine Department of Education, the Schools Division of Sorsogon in the Bicol Region implemented the Modular Distance Learning Modality (MDLM) as a result of the Learners Enrollment and Survey Form (LESF). Learning Modules from the Regional office of the Department of Education were the primary teaching and learning material used in delivering instruction. It was then later converted into Learning Activity Sheets (LAS) mandated by the Regional Office to be prepared by every teacher. However, during the pandemic education school year 2020-2021, learning competencies in Probability and Statistics were not reached nor even tackled, and no materials were made for it whether SLM or LAS as feedback from the teachers in the field.

This article examined the Kto10 Most Essential Learning Competencies (MELCs) in Probability and Statistics backed up by the experiences of Mathematics Teachers in Elementary level and Secondary Levels (Junior High School only). The essential learning competencies from the Kto10 Mathematics Curriculum were assessed to provide a reflective description of the issues and concerns in teaching the subject. The study dealt with the identification of the gaps in the MELCs across the grade level emphasizing lesson continuity and lesson congestion as a preliminary assessment report. The learning competency gap integration framework was proposed to maximize lesson continuity across grade levels of Kto10 Mathematics content areas.

MATERIALS AND METHODS

This study utilized the critical qualitative approach of evaluating the Philippine Kto10 Mathematics Curriculum and Most Essential Learning Competencies (MELCs) in Probability and Statistics. According to [13], critical qualitative research unveils, explores, and criticizes social assumptions by questioning the framework in which learning occurs, including foundations that shape teaching experiences. Furthermore, as defined by [21], this study used curriculum mapping as a method of analysis, which is a procedure that creates a visual representation of the curriculum based on real-time data. It also includes curriculum evaluation [11], which focuses on curriculum reformation and enhancement by determining the gap in the Most Essential Learning Competencies (MELCs) across grade levels and integrating the identified gap in teaching.

The Philippine Kto10 Mathematics Curriculum [4] and the Most Essential Learning Competencies (MELCs) [6] were used to extract information for mapping the learning content and competencies in Probability and Statistics. They were the main documents used in comparing the competencies and determining the gaps especially in the MELCs across grade level along with the lesson continuity and lesson congestion.

Teachers' responses and experiences in implementing the Kto10 curricula along Probability and Statistics, on the other hand, were identified through an interview using an open-ended question guide among the purposefully selected 12-teacher participants (5 in Elementary, 7 in Junior High School). The participants were composed of seven teachers with 3-5 teaching experiences, and five teachers with 15-20 teaching experiences. With regards to their academic rank, there were seven teachers identified as Teacher I, one Teacher II, two Teacher III, and two Master Teacher I. All residing in the vicinity of Bicol Region, Philippines, still in the service, and experienced the pandemic education during the school year 2020-2021. These identified teacher participants in the study were the only pre-selected participants who expressed their intention to participate in the entire research process through informed consent.

Key interview questions were used in the study to demonstrate the experiences, issues, and concerns of mathematics teachers in teaching Probability and Statistics in both the previous curriculum and the Kto10 MELCs. The following key questions were asked during the interview: (a) How would you compare your teaching and learning experiences before and during the Kto10 MELCs along Probability and Statistics [Please specify]? (b) How do you respond to the identified challenges in teaching the Kto10 MELCs using the modular printed distance learning [Please specify]? Follow-up questions were asked to expand on the concept and deepen the analysis of the details. The data from teachers' responses and experiences were collected using electronic questionnaire (Google Forms) interviews and further validated using unstructured interviews.

In this study, the curriculum review and curriculum mapping were used. These were the methods of analysis used for curricular evaluation to determine whether there are any discrepancies, gaps, or issues with lesson continuity [14] which serve as a basis for curricular recommendations backed up with perceptions and experiences of teacher participants of this study. The identified competency gap in the teaching towards lesson continuity across grade level as preliminary evaluation report were used in the development and validation of the proposed lessons as intervention.

RESULTS AND DISCUSSIONS

Comparison of the Content Topics of Kto10 Mathematics Curriculum with the Most Essential Learning Competencies (MELCs)

Statistics has two types, namely, descriptive, and inferential. Descriptive statistics is concerned with the summarization of data in various ways, which includes the creation of graphs, charts, and tables, as well as the calculation of various descriptive measures such as averages, measures of variation, and percentiles.

Inferential statistics, on the other hand, is an inference associated with the data set, a conclusion drawn about the population from which the data originated. It consists of methods for drawing and measuring the reliability of population conclusions based on data from a sample of the population. While probability is a branch of mathematics that is fundamentally defined as the ratio of the number of favorable outcomes to the total number of outcomes [12].

Probability and Statistics in the Philippine Kto10 Mathematics is divided into five major content areas: data collection, data organization and presentation, data interpretation, statistical measures, and probability [18]. Figure 1 depicts the mapping of Kto10 Curriculum Probability and Statistics Content Topics to Most Essential Learning Competencies (MELCs). The figure shows that all MELCs topics overlapped with the Kto10 Mathematics Curriculum. There were 15 topics removed from the old curriculum, and what remained were rationalized into the Most Essential Learning Competencies (MELCs) in Probability and Statistics.

Content Topics	Grade Level										
	K	1	2	3	4	5	6	7	8	9	10
1. DATA COLLECTION	Blue	Blue	Blue	Yellow	Yellow	Blue	Blue	Yellow			
2. DATA ORGANIZATION AND PRESENTATION											
2.1 Tables (simple table, frequency table)		Blue	Blue	Yellow	Yellow	Yellow		Yellow			
2.2 Graphs											
2.2.1 Pictographs		Yellow									
2.2.2 Bar Graphs					Yellow						
2.2.3 Line Graphs						Yellow		Yellow			
2.2.4 Circle Graphs							Yellow				
2.2.5 Histograms								Yellow			
3. DATA INTERPRETATION											
3.1 Pictographs		Blue	Yellow								
3.2 Bar Graphs				Yellow	Yellow			Blue			
3.3 Line Graphs						Yellow		Blue			
3.4 Circle Graphs							Yellow				
3.5 Histograms								Blue			
4. STATISTICAL MEASURES											
4.1 Measures of Central Tendency											
4.1.1 Mean						Blue		Yellow	Yellow		
4.1.2 Median								Yellow	Yellow		
4.1.3 Mode								Yellow	Yellow		
4.2 Measures of Dispersion											
4.2.1 Range								Yellow	Yellow		
4.2.2 Variance								Yellow	Yellow		
4.2.3 Standard Deviation								Yellow	Yellow		
4.3 Measures of Position											
4.3.1 Quartiles											Yellow
4.3.2 Deciles											Yellow
4.3.3 Percentiles											Yellow
5. PROBABILITY											
5.1 Concept and Definition		Blue	Blue	Yellow	Yellow	Yellow	Yellow	Yellow			Yellow
5.2 Experimental & Theoretical Probability					Blue	Yellow	Yellow	Yellow			
5.3 Permutations											Yellow
5.4 Combinations											Yellow

Legend: ▢ (Yellow) Present in both Kto10 MC and MELCs   ▢ (Blue) Present in Kto10 MC only

Figure 1. Mapping of Probability and Statistics Content Topics of Kto10 Curriculum vis-à-vis Most Essential Learning Competencies (MELCs)

In Grade 9, no topic was ever recorded both in Kto10 Mathematics Curriculum and the present curriculum. It can be gleaned that this was considered as a gap in kindergarten to grade 8 and grade 10 when it comes to the distribution of content topics in Probability and Statistics considering the spiral progression approach. Meanwhile, Grade 7 has the most topics covered comprises of 15 out of 25 Content Topics. In kindergarten, the only content topic which was on Data Collection was removed. Thus, it is assumed that there were no essential competencies designated for this level. Content topics comprised of learning competencies hence it is directly connected. Moreover, content topics for grades 3 and 8 were remained (none removed, none merged).

Based on the initial report of the researcher, content topics as well as learning competencies from Kto10 Math Curriculum were just reduced, none merged, and none added. Among the five content areas of Kto10 Mathematics Curriculum, Probability and Statistics has the least Content Topic composed of 25 out of 269 topics and which is usually seen in the 4th quarter of the Curriculum Guide. The Kto12 Basic Education Curriculum emphasized the learning area standard of establishing the learner's understanding and appreciation of key concepts and principles of mathematics as applied [5]. In Probability and Statistics, the key stage standards designated in Probability as its last content topic were traced in the Most Essential Learning Competencies.

Table 1 shows the sample Progression of lesson in Probability in MELCs. In lower elementary (Kindergarten to grade 3), the key concept in Probability is about predicting outcomes and was seen evidently from the sample learning competency grade 3 from the table below. In upper elementary (Grades 4 to 6), centered in simple experiment and experimental probability. Moreover, in grades 7 to 10, the highlighted standard is more on solving probability as shown in the sample competencies in table 1.

Table 1. Progression of Learning Competencies in Kto10 Probability

Grade Level	Lower Elementary (Kinder to3)	Upper Elementary (Grade 4to6)	High School (Grade 7to10)
Sample Learning Competency	Tells whether an event is sure, likely, equally likely, unlikely, and impossible to happen (M3SP-IVi-7.3)	Makes simple prediction of events based on the results of experiments (M6SP-IVi-23)	Solves problems involving probability (M10SP-IIIi-j-1)
Sample Problem	Determine whether each event is impossible, unlikely, equally likely, likely, or certain. 1. A coin is tossed lands up tail. 2. The sun will rise tomorrow	How many times would the coin land on heads if you tossed it 50 times?	Suppose a coin is tossed five times, what is the probability of getting five heads?

Competencies from lower years served as a basic pre-requisite skill needed for the students to be prepared for the succeeding grade levels. It can be gleaned that the spiral progression approach of the curriculum is vertically coherent particularly in Probability and Statistics. The competencies listed per grade level were increasing in difficulties which considered as one of the best structures of the spiral curriculum as expounded also in the study of [10].

Table 2 shows the distribution of learning competencies between Kto10 Math Curriculum and MELCs in Probability and Statistics. It highlights that the competencies from kindergarten and grades 1, 2, 4, 5, 6, 7 and 10 were reduced while in grades 3, 8 and 9 retained. From 89 competencies in the Kto10 Mathematics Curriculum, narrowed down into 66 competencies in the Most Essential Learning Competencies (MELCs). It is possible to conclude that the overcrowded learning competencies of the Kto10 Mathematics Curriculum were decongested, assuming that this is one of the actions taken to address issues in the basic education curriculum, specifically in Probability and Statistics.

Table 2. Comparison of Learning Competencies in Probability and Statistics

DepEd Document	GRADE LEVEL											TOTAL
	K	**1**	**2**	**3**	**4**	**5**	**6**	**7**	**8**	**9**	**10**	
Kto10 Math Curriculum	4	6	6	6	10	10	12	12	5	0	18	89
MELCs	0	2	2	6	9	8	7	11	5	0	16	66

In the Kto10 Mathematics Curriculum, there are many learning competencies that must be covered within the school year, with learners studying in a limited time allotted for each grade level [16]. In Probability and Statistics, feedback from teacher-informant teaching grade 2 with 17 years of experience reveals *"Since Probability and Statistics were the last topic in the last quarter, sometimes the skills were not met"*. Hence, the reduction of competencies provided a possibility for every curriculum implementer the chance to address this concern.

Some of the competencies were removed because of its redundancy as one of the main reasons. Tracing back the competencies from the Kto10 Mathematics Curriculum, the following were samples of redundant competencies in the content topic *Data Collection* that can no longer seen in MELCs: *Collect data on one variable (e.g., sex/boys or girls) through observation and asking questions* (MKAP-00-1); *Collects data on one variable through simple interview* (M1SP-IVg-1.1); *Collects data on one variable using a questionnaire* (M2SP-IVh-1.2); *Collects data on one to two variables using any source* (M5SP-IVg-1.5) ; and *Collects data on one or two variables using any source* (M6SP-IVe-1.6). It follows that what were remained were seen in grades 3, 4 and 7 with competencies *Collects data on one variable using existing records* (M3SP-Ig-1.3)", *Collects data on two variables using any source* (M4SP-IVg-1.4), and *Gathers statistical data* (M7SP-IVb-1)", respectively.

Most Essential Learning Competencies (MELCs) Gaps Across Grade Level

The implementation of the MELCs is one way of addressing the issues and concerns in the congested Kto10 Mathematics Curriculum. However, it does not guarantee that the target experiences intended will be realized. Since MELCs in Probability and Statistics is just a simplified form of the old one, gaps across grade level are still there. Shown in figure 2 that in grade 9, no learning competencies included. This served as a primary gap within and across the curriculum. It can be gleaned also from the figure that the key competencies included in Statistics circulates on Descriptive statistics only. It is the only type of Statistics that was present in the Kto10 Mathematics Curriculum as well as Most Essential Learning Competencies (MELCs).

Key competencies such as *Explains, calculates, solves, and interprets problems involving measures of positions in Descriptive Statistics:* and *Defines, derives the formula, and solves problems involving permutations and combinations* were among the topics in grade 10 that have no introductory or informal discussion in the lower grade levels. Though the pre-requisite skills needed in the first one seen in grades 7 and 8 (competencies for mean, median, mode), but were not reinforced in grade 9. The two identified key competencies both involve mathematical formula in solving problems concerning measures of position, and permutation and combination, respectively. Feedback from a Master Teacher I of Matnog, Sorsogon handling grade 10 having two decades of teaching experience shared that "*Most of the students find difficulty in applying formula in Statistics*". Moreover, another informant teaching the same grade level from Sorsogon City said, "*Students tend to forget easily the concepts connected to the current topic, also the application of the concepts in Probability and Statistics in most of the students remain abstract even if we, teachers, already contextualized them according to their differences*". This was because there is an existing gap across grade 10 as seen in the figure. Furthermore, if the concepts taught have no practical application in the real world, students are more likely to forget them and are not challenged to develop critical thinking abilities. According to various studies, mathematics curricula tend to emphasize abstract concepts rather than application or discovery of concepts.

Key Competencies	Grade Level										
	K	1	2	3	4	5	6	7	8	9	10
Collects & organizes data using charts, tallies, and tables.											
Constructs, reads, solves, and interprets data presented in pictograph (table, bar graphs, line graph and circle graph)		■	■	■	■	■	■				
Tells, predicts, describes, and records outcome of experiments and/or event.				■	■						
Analyzes and makes simple predictions of events based on the list and diagrams of outcomes of the given situation.						■	■				
Explains the importance and uses of statistics.								■			
Represents, analyzes, and interprets accurately data from graphic and other statistical representations.							■	■			
Finds and solves problems involving (average value) measures of central tendencies (mean, median and mode) of ungrouped and grouped data.								■			
Explains, calculates, solves, and interprets problems involving measures of positions: quartiles, deciles, and percentiles.											■
Illustrates and describes the different measures of variability of a given set of data.								■			
Describes and interprets data set using the box plot method.											■
Defines and describes experiment, outcome, sample space, event, union, and intersection of events, and probability of event.						■	■				■
Uses fundamental counting principle to count number of arrangements with and without order.									■		■
Defines, derives the formula, and solves problems involving permutations and combinations.									■		■
Defines, finds, and solves problems involving probabilities such as union and intersection of two events.									■		■

Legend: ■ Present Learning Competency

Figure 2. Mapping of Probability and Statistics Key Competencies of MELCs

When it comes to the actual teaching scenario, teachers are having difficulty in delivering instruction considering the new normal set up of education. Feedback with regards to the challenges encountered using MELCs from a Master Teacher I of Matnog, Sorsogon reveals "*It is the unpacking of the essential competencies*". This is related to the response of the teacher-informants teaching grade 1 and 10 both have 3 years of teaching experience state that "*Prior knowledge of the topic*" and "*Lack of prerequisite skills among students*", respectively, as one of the problems encountered. Some of the competencies removed were the prerequisite skills of a successive lesson. The MELCs' identification is based on prescribed standards and does not deviate from the standards-based basic education curriculum. Teachers are encouraged to break down competencies into more specific objectives based on the needs of the learners for competencies to be achieved within the specified grade level (Department of Education, 2020).

With the implemented distance learning modality, informants of this study revealed that they employed different techniques and supplementary modalities on how they teach the content. A teacher II informant of Sorsogon City with 17 years of teaching experiences in elementary school states that "*Teaching the parents with the process during distribution of modules helped the pupils to understand the lesson*". This is one way of delivering instruction since the role of parents in the pandemic education is very essential. Another feedback from grade VI teacher I of Bulan, Sorsogon emphasized that "*Unpacking of competencies into simpler objectives and making additional learning activity sheets helped learners a lot in understanding the lessons*". Follow up questions in an unstructured interview among the informants revealed that they used any possible means to deliver the lesson among students in the time of pandemic. Supplementary to the self-learning modules/LAS given, intervention was made such as home visitation,

online and offline monitoring, making video lessons, mentoring, and even teleconferencing conducted to ensure the learning of students.

However, three of the teacher-informants in Junior High School all teaching grade 7 mathematics, and another three elementary teachers teaching grade 2, grades 4 to 6, and another one grade 6, all stressed that prior to the pandemic Probability and Statistics based were not being taught properly. Feedback from teacher II informant with 15 years of teaching experience handling grades 4 to 6 stated that "*Learning competencies of Probability and Statistics seen in the 4th quarter of CG, is not taught properly due to lack of time*". Prior to the pandemic, the Sorsogon Schools Division issued a memorandum on the use of elementary and secondary numeracy levels. The Curriculum Implementation Division (CID) oversaw the creation of Division Numeracy Tools, the content of which were the least learned mathematical competencies. Unfortunately, no problems involved related to any of the competencies of Probability and Statistics. There was no least learned designated for it since it is not even taught properly as reflected by the feedbacks of the informants.

Framework for Learning Competency Gap Integration

The spiral progression approach is defined as a course field of study in which students will see the same topics in increasing complexity and reinforcing previous learning throughout their school career. However, there are several gaps observed in the implementation of the Kto10 Philippine Mathematics Curriculum particularly in Probability and Statistics where discontinuity of lessons was experienced from kindergarten to higher grade levels. Factors such as *Overcrowded Curriculum Content*, *Time Allotment*, and *Lack of Prerequisite Skills of Learners* observed before the pandemic as reflected in the feedback among teacher-informants. Moreover, challenges encountered in the present pandemic education were categorized into three, these are the following: *Unpacking of MELCs*; *Instruction and Lesson Delivery*; and *Lack of Instructional Materials*.

An explicit curriculum scenario along with Probability and Statistics content was the discontinuity of the lesson content in Grade 9. The set of learning competency taught on Grade 8 in Probability and Statistics were not reinforced in grade 9 which make it clear that there is an existing discontinuity of lesson in latter content area. Feedback about issues and concerns in the curriculum from a Junior High School Master Teacher 1 in Sorsogon City said, "*Discontinuity of the topics from Grade 7 to 10 and this makes it difficult to bridge topics one-year level after anothe*r". One way to bridge the learning gap between K-grade 8 and grade 10, is to integrate competencies in Probability and Statistics within the lessons in Grade 9 mathematics whenever possible. The researchers then proposed a framework allowing an integration of competencies as a form of intervention to establish continuity of lessons across grade level as shown in Figure 3.
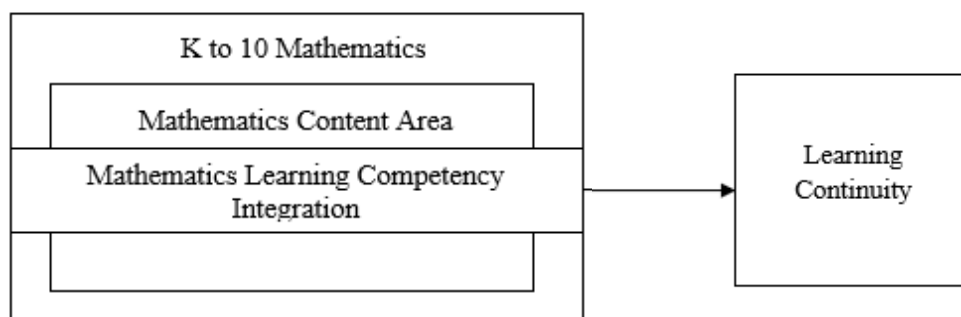

Figure 3. Framework for Mathematics Learning Competency Integration

The framework explained that *Mathematics Learning Competency Integration* can be used in any of the five *Mathematics Content Areas*: Number and Number Sence; Measurements; Geometry; Patterns & Algebra; and Probability and Statistics. Moreover, this can also be used in any grade levels from *kindergarten to Grade 10 Mathematics*. Since there is an existing discontinuity of the lesson, this

integration framework may provide an avenue on how to address the identified factors as reflected among the feedback of the informants to establish *Learning Continuity*. This can be done by identifying the Most Essential Learning Competencies in any content areas and integrating it to the lessons where discontinuity exist provided however that it bears connections to the actual lesson taught.

This *Mathematics Learning Competencies Integration* can be used not just for filling the gaps across grade levels in Probability and Statistics particularly in Grade 9 but also to other grade levels in any Mathematics Content Areas whenever possible. Considering the major gap across grade level in Probability and Statistics, the set of competencies designated for grade 9 Mathematics where the content topics circulates only on the two content areas namely *Patterns and Algebra* and *Geometry* [5]. The key content topics for Patterns and Algebra includes the following: quadratic equations and inequalities; quadratic functions; rational algebraic equations; variations; and radicals. While Geometry includes parallelograms and triangle similarities and basic concepts of trigonometry. With the integration of Probability and Statistics competencies, gaps across grade level may be bridged enabling the learners to be prepared for the higher level of lessons in grade 10.

The *Mathematics Learning Competencies Integration* also supports the unpacking and combining of MELCs into Learning Objectives. Moreover, there are three important aspects that need to consider when unpacking. These are the following: *Arrangement on the Content and Performance Standards*; *Prerequisite knowledge and skills*; and *Rational sequence of learning objectives* [6]. In combining MELCs, field implementers are encouraged to consider these two criteria, namely, *Commonality of content, topic or theme* and *Alignment with the Content and Performance Standard.* These key elements were provided for teachers to ensure that the knowledge and skills anchored from the lesson would be emphasized, allowing for the achievement of MELCs and the effective design of instructional resources without deviating from the standards prescribed by the Philippine Kto10 Mathematics Curriculum. Moreover, the framework is established by the underlying educational principle and philosophy of *Progressivism* which supports the statement that Mathematics Curriculum is evolving through time in response to the needs of the learners [2].

CONCLUSION

The issuance of MELCs in the Philippine Basic Education sector was seen as a good initiative in decongesting the overcrowded Kto10 Mathematics Curriculum. The redundancies of the content topics and essential competencies in Probability and Statistics across grade level were removed and reduced (from 89 to 66 learning competencies) to cope up with the present educational crisis brought by the pandemic. The learning competencies taught per grade level were increasing in complexities which can be considered as a good feature of the spiral curriculum. However, gaps were still seen along lesson continuity across grade level particularly in grade 9. The mathematics learning competency gap integration framework is proposed to maximize the learning continuity across levels. This was to bridge the gap in the teaching towards lesson continuity across grade level. The unpacking of learning competencies into simpler learning objectives was also highly encouraged to systematize learning activities and effectively address the needs of learners. The identified Most Essential Learning Competencies in Probability and Statistics may be used by DepEd curriculum implementers even when distance learning is lifted. This paper recommends for educational authorities and researchers to further explore how the identified content topics in Probability and Statistics were taught across grade levels.

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