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Exploration of the Teaching and Learning Processes in Mathematics: Basis for Strategic Intervention

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Abstract

This study investigates the challenges encountered in teaching and learning Grade 5 Mathematics during the initial two quarters of the 2022-2023 school year, with a focus on specific Most Essential Learning Competencies (MELCs). The research, rooted in the Philippine educational context and the challenges posed by the K–12 program, explores the perspectives of both teachers and learners. It identifies challenging MELCs, emphasizing problem-solving, division, fractions, and decimals. Teachers employed strategies such as Learning Action Cell (LAC) sessions and in-service trainings to address these challenges, underscoring the importance of Job-Embedded Learning (JEL) for effective knowledge application in the classroom. The study highlights the need for ongoing evaluation, formative classroom observations, coaching, and mentoring to sustain effective teaching practices. It also draws from the reflective approach of Gibb's Reflective Cycle to systematically address positive and negative aspects of intervention activities. Additionally, the research proposes a strategic intervention program aimed at narrowing learning

gaps among Grade 5 learners, incorporating remedial instruction, additional activities, vocabulary enhancement, and parent conferences. The findings contribute valuable insights to the broader goal of improving Mathematics education at the elementary level in the Philippines, aligning with the educational objectives and challenges faced by educators and administrators.

Keywords: Mathematics, Most Essential Learning Competencies, Least Mastered Skills, Grade-5 teachers and learners, Strategic Intervention Plan

Introduction

Education is a prerequisite tool to enhance opportunities for learners to practice their social, cultural practices, and origins (Mohd & Roslan, 2016). One of the goals of education is to prepare individuals for the competencies needed in the 21st century and to train them well-equipped in this sense.

Teacher's diagnostic competence could be defined as teachers' ability to interpret students' thinking and reasoning process, to monitor students' progress and difficulties, and to provide appropriate responses to the results of the diagnosis (Wijaya, 2019). With respect to diagnostic competence, students have different preconditions therefore teachers need to recognize each student (Tolsdorf & Markic, 2017) and must be able to describe and interpret the individual student's abilities and difficulties.

Mathematics emerged as a subject of study along with civilization. In the present scenario, mathematics is absolutely necessary subject for living. This importance is evident in school curriculum and in the importance given to mathematics education (Gafoor & Kurukkan, 2015).

Students' performance in mathematics is consistently given attention in different countries because it is regarded as the main subject, which is significant for the growth and development of the nation (Capuno et al., 2019). The knowledge and skills of students in mathematics are essential in their daily lives in overcoming the difficulties that one may face (Mohamed & Waheed, 2011; Capuno et al., 2019).

The Philippines took part in the Trends in International Mathematics and Science Study (TIMSS) in 2003, and out of the 38 participating nations, it came in 34th in Mathematics. Additionally, the Global Competitiveness Report of the World Economic Forum places the nation 79th out of 138 participating nations in terms of the quality of mathematics education for the 2016–2017 academic year. The National Achievement Test (NAT) results showed that the mean percentage score (MPS) for high school was below the students' intended performance, according to the Department of Education (DepEd) of the Philippines.

One of the significant innovations and seen as essential to the development of the country is the incorporation of the K–12 program into the Philippine Basic Education Curriculum. Today, critics continue to insist that the country is not yet prepared for the transition (Refugio et al., 2020). They mentioned that many problems and difficulties have been faced by school administrators and teachers in the different learning areas across grade levels, specifically in the areas of Mathematics and Science. Interestingly, Mathematics education researchers globally examined a wide range of

issues and practices in Mathematics classrooms from various angles. The findings suggested ways for improving teaching Mathematics at the secondary level.

The aforementioned scenarios inspire the researcher to go into the details of these challenges in teaching and learning Mathematics encountered by both the teachers and the learners, respectively. Over the years, Mathematics is a subject that is least learned by our students in the school. During quarterly SMEA Report, a number of issues and concerns is in the area of Mathematics like low academic performance and number of learning competencies not taught in a quarter. It was noticed that 65%, on the average, of the learners have grades within the range 75-79 in Mathematics. This was alarming given the fact that quarterly assessments were all Teacher-made tests.

Also, only 98%, on the average, of the learning competencies in a quarter were taught. There were a few which were carried over in the next quarter. At the end of the school year, a few of the learning competencies were not delivered to the learners. This scenario has caused tremendous impact in the learning ability of the students since mathematics subject requires pre-requisite lessons prior to proceeding to the next learning competencies.

Studying the grassroots of these challenges in the field provides better perspectives on the nature of these issues and concerns and their corresponding appropriate interventions that best tailor-fit to the identified gaps. Determining the bottlenecks in teaching Mathematics and designing a program that can gradually elevate the performance of the learners in this area is the target output of this piece of work. It hopes to contribute to the overall target of the Schools Division Office of Carcar City that is improved teaching and learning in Mathematics. Thus, this study on the challenges encountered in teaching Grade 5 Mathematics vis-à-vis least mastered competencies of the learners as the bedrock in designing strategic intervention that aims at narrowing these learning gaps/losses.

Research Questions

The use of appropriate intervention is a must in teaching mathematics. Finding out where the students stand in relation to the Most Essential Learning Competencies (MELCS) of DepEd is a crucial part of a teacher's job. Once learning gaps in relation to learning abilities have been found, it is the teacher's duty to narrow these gaps using the proper strategies. Hence, the main objective of this study was to design strategic intervention for Grade 5 learners who have learning gaps/losses in Mathematics.

Specifically, it sought to answer the following problems:

4. What are the levels of challenges encountered in teaching and learning Mathematics 5 for Quarters 1 and 2 of school year 2022-2023 in terms of:
    4.1 teacher’s perspective; and
    4.2 learner’s perspective?

5. What are the strategies employed to overcome these challenges?

6. What strategic intervention can be designed to address these challenges in a collegial manner?

Methodology

This study utilized the descriptive method of research. Descriptive research is the best option, in accordance with McCombes (2019), when the goal of the study is to discover features, frequencies, trends, correlations, and categories. A helpful technique for scientific research that tries to describe the current state of events or phenomena is the descriptive method. These could include gathering data, outlining the traits of the respondents being studied, and keeping track of how frequently the researcher notices a particular trait or event. It might also include explaining how two or more variables interact with one another.

The descriptive method is the most popular approach since it enumerates the traits of a person, a group, or an environment. This type of research methodology was used by the researcher to get first-hand information from the outcomes of the respondents' evaluations, which helped to generate logical and sound findings and suggestions for the study. This method described the profile of the teachers in terms of their years of teaching experience in Mathematics and highest educational attainment.

This study also utilized the quantitative research in finding for patterns, averages, and predictions on the level of challenges encountered by these teachers in the delivery of Grade 5 Mathematics. According to Apuke (2017), quantitative research involves the utilization and analysis of numerical data using specific statistical techniques to answer questions like who, how much, what, where, when, how many, and how. Hence, this enabled the researcher to generate knowledge and create a better perspective of the challenges encountered in teaching Grade 5 Mathematics as well as the preliminary steps undertaken by teachers in the attempt of improving the learners' academic performance in this learning area. The results of the study were used as the basis in designing a strategic intervention for the learners that will help them elevate their performance in Mathematics.

Results and Discussion

The Levels of Challenges Encountered In Teaching and Learning Mathematics 5 for Quarters 1 & 2 of Sy2022-2023

This section discusses the levels of challenges encountered by both the teachers and the learners in teaching and learning Grade – 5 Mathematics in the first two (2) quarters of school year 2022-2023. On one hand, teachers rated the MELCs as Not Challenging to Teach, Slightly Challenging to Teach, Moderately Challenging to Teach, Challenging to Teach, and Very Challenging to Teach. On the other hand, learners rated these MELCs as Not Challenging to Learn, Slightly Challenging to Learn, Moderately Challenging to Learn, Challenging to Learn, and Very Challenging to Learn.

Table 1 shows the level of challenges encountered by the teachers in the most essential learning competencies in Mathematics for Quarters 1 & 2 of school year 2022-2023. Their responses varied from Slightly Challenging to Teach up to Very Challenging to Teach.

As shown in Table 1, the first four highest ratings were 4.50, Very Challenging to Teach, 4.40, Very Challenging to Teach, 4.30, Very Challenging to Teach, and 4.20, Challenging to Teach

while the lowest ratings were 2.00 and 2.10 described as Slightly Challenging to Teach. These MELCs were in Quarter 2. There were **adds and subtracts decimal numbers through thousandths without and with regrouping** and **gives the place value of a digit of a given decimal number through ten thousandths,** respectively.

Table 1.

The Level of Challenges Encountered by the Teachers

Key Concepts in Grade 5 Mathematics (based on MELCs of DepEd)	Average Rating (Weighted Mean)	Description
1. Divisibility, order of operations, factors and multiples, and the four fundamental operations involving fractions		
a. uses divisibility rules for 2, 5, and 10 to find the common factors of numbers	2.60	SCT
b. uses divisibility rules for 3, 6, and 9 to find common factors	2.70	MCT
c. uses divisibility rules for 4, 8, 12, and 11 to find common factors	2.50	SCT
d. solves routine and non-routine problems involving factors, multiples, and divisibility rules for 2,3,4,5,6,8,9,10,11, and 12	4.40	VCT
e. Performs a series of more than two operations on whole numbers applying Parenthesis, Multiplication, Division, Addition, Subtraction (PMDAS) or Grouping, Multiplication, Division, Addition, Subtraction (GMDAS) correctly	3.60	CT
f. finds the common factors, GCF, common multiples and LCM of 2–4 numbers using continuous division	3.70	CT
g. solves real-life problems involving GCF and LCM of 2-3 given numbers	4.20	CT
h. adds and subtracts fractions and mixed fractions without and with regrouping	3.80	CT
i. solves routine and non-routine problems involving addition and/or subtraction of fractions using appropriate problem-solving strategies and tools	4.40	VCT
j. visualizes multiplication of fractions using models	4.00	CT
k. multiplies a fraction and a whole number and another fraction	3.90	CT
l. multiplies mentally proper fractions with denominators up to 10	3.30	MCT
m. solves routine or non -routine problems involving multiplication without or with addition or subtraction of fractions and whole numbers using appropriate problem-solving strategies and tools.	4.30	VCT

n. shows that multiplying a fraction by its reciprocal is equal to 1	3.70	CT
o. visualizes division of fractions	3.80	CT
p. divides simple fractions and whole numbers by a fraction and vice versa	4.20	CT
q. solves routine or non -routine problems involving division without or with any of the other operations of fractions and whole numbers using appropriate problem-solving strategies and tools	4.50	VCT
SUB-AVERAGE	**3.74**	**CT**
2. Decimals		
a. gives the place value and the value of a digit of a given decimal number through ten thousandths	2.10	SCT
b. reads and writes decimal numbers through ten thousandths	3.40	MCT
c. rounds decimal numbers to the nearest hundredth and thousandth	3.30	MCT
SUB-AVERAGE	**2.93**	**MCT**
3. Four fundamental operations involving decimals and ratio and proportion		
a. compares and arranges decimal numbers	2.30	SCT
b. adds and subtracts decimal numbers through thousandths without and with regrouping	2.00	SCT
c. solves routine or non -routine problems involving addition and subtraction of decimal numbers including money using appropriate problem-solving strategies and tools	4.20	CT
d. multiplies decimals up to 2 decimal places by 1 - to 2 - digit whole numbers	3.00	MCT
e. multiplies decimals with factors up to 2 decimal places	2.90	MCT
f. estimates the products of decimal numbers with reasonable results	2.60	SCT
g. solves routine and non -routine problems involving multiplication without or with addition or subtraction of decimals and whole numbers including money using appropriate problem- solving strategies and tools	4.20	CT
h. divides decimals with up to 2 decimal places	4.00	CT
i. divides whole numbers with quotients in decimal form	4.00	CT
j. solves routine and non -routine problems involving division without or with any of the other operations of decimals and whole numbers including money using appropriate problem-solving strategies and tools	3.80	CT
k. visualizes the ratio of 2 given numbers	3.30	MCT
l. identifies and writes equivalent ratios	3.80	CT
m. expresses ratios in their simplest forms	4.00	CT
n. finds the missing term in a pair of equivalent ratios	4.00	CT
o. defines and describes a proportion	3.90	CT

p. recognizes when two quantities are in direct proportion	4.20	CT
SUB-AVERAGE	**3.51**	**CT**
GENERAL AVERAGE	**3.64**	**CT**

Range	Description	
4.21 - 5.00 -	Very Challenging to Teach	- VCT
3.41 - 4.20 -	Challenging to Teach	- CT
2.61 - 3.40 -	Moderately Challenging to Teach	- MCT
1.81 - 2.60 -	Slightly Challenging to Teach	- SCT
1.00 - 1.80 -	Not Challenging to Teach	- NCT

One (1) MELC was rated as 4.50 which was **Solving routine or non-routine problems involving division without or with any other operations of fractions and whole numbers using appropriate problem-solving strategies and tools.** Two (2) MELCs were rated as 4.40 which were **Solving routine and non-routine problems involving factors, multiples, and divisibility rules for 2, 3, 4, 5, 6, 8, 9, 10, 11, and 12,** and **Solving routine and non-routine problems involving addition and/or subtraction of factions using appropriate problem-solving strategies and tools.**

One (1) MELC received a rating of 4.30 which was **Solving routine or non-routine problems involving multiplication without or with addition or subtraction of fractions and whole numbers using appropriate problem-solving strategies and tools.** Five (5) MELCs received a rating of 4.20 which were the following: 1) **Solving real-life problems involving GCF and LCM of 2-3 given numbers**, 2) **Dividing simple fractions and whole numbers by a fraction and vice versa,** 3) **Solving routine or non -routine problems involving addition and subtraction of decimal numbers including money using appropriate problem-solving strategies and tools, 4) Solving routine and non -routine problems involving multiplication without or with addition or subtraction of decimals and whole numbers including money using appropriate problem- solving strategies and tools,** and 5) **recognizes when two quantities are in direct proportion.**

The above findings matched with the results in Table 1. The least learned MELCs of the Grade – 5 learners were the items that the teachers found very challenging to teach and challenging to teach. It can be deduced that the teachers failed to simplify the steps in transferring the knowledge and skills to the students. One reason that made a topic challenging to deliver is the insufficient background of the teachers in terms of knowledge and skill acquisition. This is not surprising because teachers who are handling the subject are not specializing Mathematics. Sevimli & Unal (2022) cited that it is important to evaluate teachers' perceptions to understand the usefulness of an educational approach or method in classroom practice.

Most of the items that were very challenging to teach by the Grade – 5 teachers were into solving word problems. As discussed earlier, problem-solving requires both mastery in mathematics language and mastery of the four fundamental operations. According to Mulwa (2015), the principal role of language in mathematics instruction is to enable teachers and learners to communicate mathematical information accurately so that the objectives of teaching mathematics are realized. He stated that the vocabulary and technical terms used by the mathematics teacher and in the textbooks should be arranged so that the students in that particular class can understand

their meaning. Teachers with less knowledge and skill in Mathematics, because it is not their field of specialization, are also grappling with the challenge of understanding the language of the subject. This difficulty has domino effect to teaching and learning.

Table 2 displays the level of challenges encountered by the Grade – 5 learners in the most essential learning competencies in Mathematics for Quarters 1 & 2 of school year 2022-2023. Their responses varied from Slightly Challenging to Learn up to Challenging to Learn.

As displayed in the table, the first five (5) highest ratings were 3.66, described as Challenging to Learn, 3.63, Challenging to Learn, 3.62, Challenging to Learn, 3.59, Challenging to Learn, and 3.57, Challenging to Learn. These competencies were as follows: 1) **solves routine and non - routine problems involving division without or with any of the other operations of decimals and whole numbers including money using appropriate problem-solving strategies and tools** (3.66), 2) **solves routine and non-routine problems involving addition and/or subtraction of fractions using appropriate problem-solving strategies and tools** (3.63), 3) **divides whole numbers with quotients in decimal form** (3.62), 4) **divides decimals with up to 2 decimal places** (3.59), and 5) **adds and subtracts fractions and mixed fractions without and with regrouping** (3.57).

Table 2.
The Level of Challenges Encountered by the Learners

Key Concepts in Grade 5 Mathematics (based on MELCs of DepEd)	Average Rating (Weighted Mean)	Description
1. Divisibility, order of operations, factors and multiples, and the four fundamental operations involving fractions		
a. uses divisibility rules for 2, 5, and 10 to find the common factors of numbers	2.32	SCL
b. uses divisibility rules for 3, 6, and 9 to find common factors	2.92	MCL
c. uses divisibility rules for 4, 8, 12, and 11 to find common factors	3.06	MCL
d. solves routine and non-routine problems involving factors, multiples, and divisibility rules for 2,3,4,5,6,8,9,10,11, and 12	3.51	CL
e. Performs a series of more than two operations on whole numbers applying Parenthesis, Multiplication, Division, Addition, Subtraction (PMDAS) or Grouping, Multiplication, Division, Addition, Subtraction (GMDAS) correctly	3.39	MCL
f. finds the common factors, GCF, common multiples and LCM of 2–4 numbers using continuous division	2.63	MCL
g. solves real-life problems involving GCF and LCM of 2-3 given numbers	3.31	MCL

h. adds and subtracts fractions and mixed fractions without and with regrouping	3.57	CL
i. solves routine and non-routine problems involving addition and/or subtraction of fractions using appropriate problem-solving strategies and tools	3.63	CL
j. visualizes multiplication of fractions using models	3.26	MCL
k. multiplies a fraction and a whole number and another fraction	2.90	MCL
l. multiplies mentally proper fractions with denominators up to 10	2.89	MCL
m. solves routine or non -routine problems involving multiplication without or with addition or subtraction of fractions and whole numbers using appropriate problem-solving strategies and tools.	3.22	MCL
n. shows that multiplying a fraction by its reciprocal is equal to 1	2.71	MCL
o. visualizes division of fractions	3.07	MCL
p. divides simple fractions and whole numbers by a fraction and vice versa	3.24	MCL
q. solves routine or non -routine problems involving division without or with any of the other operations of fractions and whole numbers using appropriate problem-solving strategies and tools	3.43	CL
SUB-AVERAGE	**3.12**	**MCL**
2. Decimals		
a. gives the place value and the value of a digit of a given decimal number through ten thousandths	2.53	MCL
b. reads and writes decimal numbers through ten thousandths	2.64	MCL
c. rounds decimal numbers to the nearest hundredth and thousandth	2.46	SCL
SUB-AVERAGE	**2.54**	**SCL**
3. Four fundamental operations involving decimals and ratio and proportion		
a. compares and arranges decimal numbers	2.39	SCL
b. adds and subtracts decimal numbers through thousandths without and with regrouping	2.52	SCL
c. solves routine or non -routine problems involving addition and subtraction of decimal numbers including money using appropriate problem-solving strategies and tools	3.02	MCL
d. multiplies decimals up to 2 decimal places by 1 - to 2 - digit whole numbers	3.28	MCL
e. multiplies decimals with factors up to 2 decimal places	3.08	MCL
f. estimates the products of decimal numbers with reasonable results	3.02	MCL

g. solves routine and non -routine problems involving multiplication without or with addition or subtraction of decimals and whole numbers including money using appropriate problem- solving strategies and tools	3.50	CL
h. divides decimals with up to 2 decimal places	3.59	CL
i. divides whole numbers with quotients in decimal form	3.62	CL
j. solves routine and non -routine problems involving division without or with any of the other operations of decimals and whole numbers including money using appropriate problem-solving strategies and tools	3.66	CL
k. visualizes the ratio of 2 given numbers	3.33	MCL
l. identifies and writes equivalent ratios	3.04	MCL
m. expresses ratios in their simplest forms	3.32	MCL
n. finds the missing term in a pair of equivalent ratios	3.14	MCL
o. defines and describes a proportion	3.01	MCL
p. recognizes when two quantities are in direct proportion	2.99	MCL
SUB-AVERAGE	**3.16**	**MCL**
GENERAL AVERAGE	**2.93**	**MCL**

	Range	**Description**	
The	4.21 - 5.00 -	Very Challenging to Learn	- VCL
	3.41 - 4.20 -	Challenging to Learn	- CL
	2.61 - 3.40 -	Moderately Challenging to Learn	- MCL
	1.81 - 2.60 -	Slightly Challenging to Learn	- SCL
	1.00 - 1.80 -	Not Challenging to Learn	- NCL

competency that received the lowest ratings of 2.32 and 2.39, described as Slightly Challenging to Learn, were in **Using divisibility rules for 2, 5, and 10 to find the common factors of numbers,** and **Comparing and arranging decimal numbers,** respectively. This implied that learners have sufficient understanding on divisibility rules as a technique in finding for the common factors of the given set of numbers.

The five (5) MELCs that were on the top list of Challenging to Learn by the learners were found in the list of least mastered MELCs discussed in the findings above. This implied that both teachers and learners have the same perspectives on the MELCs which are challenging to understand by the latter. Teachers already have prior knowledge with regard to the learning competencies which learners were struggling at. This is supposed to be good news because the teachers can better prepare the lessons with the anticipation that the learning competency is challenging to grasp by the learners. However, if they lack the needed teaching pedagogy due to minimum exposure to the different strategies and techniques in handling the subject, still they will not succeed in teaching the subject. Md-Ali et al. (2021) said that teachers' beliefs about mathematics, mathematics learning, and mathematics teaching play a critical role in determining how teachers help their pupils to develop their mathematics. Wijaya et al. (2019) remarked that teachers need to have a competence to identify students' learning difficulties.

To further enhance the teaching and learning process, it is imperative to delve into specific strategies employed by teachers to overcome the identified challenges. The study reveals that Learning Action Cell (LAC) sessions and in-service trainings play a vital role in equipping educators with the necessary knowledge and tools to tackle challenging MELCs. This aligns with the findings of Aquino, et al. (2023), who advocate for continuous professional development as a means to address challenges in various learning areas effectively.

Moreover, the study advocates for the implementation of Job-Embedded Learning (JEL) principles to ensure the practical application of acquired knowledge in the classroom setting. This echoes the sentiments of educational theorists like Gibbs, whose Reflective Cycle underscores the importance of ongoing evaluation and action in the learning process. The incorporation of formative classroom observations, coaching, and mentoring serves as a robust mechanism for monitoring and supervising teachers, ensuring that the knowledge gained from professional development activities is actively applied in the educational setting (Kilag & Sasan, 2023).

Learners' attitude towards the subject is also a determinant of their success. A few of the learners in a class are mathematically inclined. This implied that teachers, after profiling their learners, must know those learners who need more support in Mathematics because their inclination is not in the subject. The affective-cognitive consistency theory elaborated by Capuno et al. (2019) stated that the way learners approach a subject will impact how well they do on it. They stressed that an unstable state occurs when an individual's attitudes toward an object and knowledge about an object are inconsistent.

Mathematics is generally least liked by learners. However, when teachers know the complexities of numbers and have varied strategies to simplify them, then learners will be better helped in understanding the lesson. Kruglanski et al. (2018) cited that the main causes of these pupils' dislike of mathematics were factors relating to the teacher and their difficulty understanding the topic. This is in support to the above results when the MELCs that the teachers found challenging to deliver were also the competencies that the learners found challenging to learn.

The importance of teachers possessing a nuanced understanding of numerical complexities cannot be overstated. When educators are well-versed in the intricacies of mathematical concepts, they are better equipped to employ diverse instructional strategies that simplify these complexities. This, in turn, significantly enhances the learning experience for students. As highlighted by Ondog, et al. (2023), the role of language in mathematics instruction is pivotal, enabling effective communication between teachers and learners and facilitating the accurate transmission of mathematical information. Teachers, armed with both subject matter expertise and effective communication skills, can bridge the gap between students' apprehension and the comprehension of mathematical concepts.

Addressing students' aversion to mathematics requires a multifaceted approach that involves not only an understanding of numerical complexities but also effective teaching strategies and positive teacher attitudes. The findings of this study align with existing literature, emphasizing the interconnectedness of teacher-related factors and students' perceptions of challenging MELCs. By cultivating a conducive learning environment and employing varied instructional approaches,

educators can contribute to reversing the negative attitudes towards mathematics and fostering a more positive and engaging learning experience for students (Kilag, et al., 2023).

Strategies Employed to Address the Challenges

Table 3 reveals the challenges encountered by the teachers taken from the above results and the corresponding strategies that they employed to address these concerns. Likewise, it reveals the challenges encountered by the learners and how these challenges were addressed by the teachers and school administrators.

As revealed in Table 2, four (4) of the enumerated challenges were common to both teachers and learners. These were as follows: 1) **solves routine and non-routine problems involving factors, multiples, and divisibility rules for 2,3,4,5,6,8,9,10,11, and 12**, 2) **solves routine and non-routine problems involving addition and/or subtraction of fractions using**

Table 3.

The Strategies Employed to Address the Challenges

CHALLENGES ENCOUNTERED BY TEACHERS	STRATEGIES EMPLOYED	CHALLENGES ENCOUNTERED BY LEARNERS	STRATEGIES EMPLOYED
1. solves routine and non-routine problems involving factors, multiples, and divisibility rules for 2,3,4,5,6,8,9,10,11, and 12	Conducted LAC Sessions	1. solves routine and non-routine problems involving factors, multiples, and divisibility rules for 2,3,4,5,6,8,9,10,11, and 12	Conducted remedial instruction
2. solves routine and non-routine problems involving addition and/or subtraction of fractions using appropriate problem-solving strategies and tools		2. adds and subtracts fractions and mixed fractions without and with regrouping	Provided additional activities
3. solves routine or non -routine problems involving multiplication without or with addition or subtraction of fractions and whole numbers using appropriate problem-solving strategies and tools.	Inclusion of the topics during In-service Training	3. solves routine and non-routine problems involving addition and/or subtraction of fractions using appropriate problem-solving strategies and tools	Provided vocabulary words
			Parents' conferencing

4. solves routine or non -routine problems involving division without or with any of the other operations of fractions and whole numbers using appropriate problem-solving strategies and tools		4. solves routine or non -routine problems involving division without or with any of the other operations of fractions and whole numbers using appropriate problem-solving strategies and tools	
5. solves real-life problems involving GCF and LCM of 2-3 given numbers	Conducted LAC Sessions	5. solves routine and non -routine problems involving multiplication without or with addition or subtraction of decimals and whole numbers including money using appropriate problem-solving strategies and tools	Conducted remedial instruction
6. divides simple fractions and whole numbers by a fraction and vice versa		6. divides decimals with up to 2 decimal places	Provided additional activities
7. solves routine and non -routine problems involving multiplication without or with addition or subtraction of decimals and whole numbers including money using appropriate problem-solving strategies and tools	Inclusion of the topics during In-service Training	7. divides whole numbers with quotients in decimal form	Provided vocabulary words
8. solves routine and non-routine problems involving addition and/or subtraction of fractions using appropriate problem-solving strategies and tools		8. solves routine and non -routine problems involving division without or with any of the other operations of decimals and whole numbers including money using appropriate	Parents' conferencing

	problem-solving strategies and tools
9. recognizes when two quantities are in direct proportion	

appropriate problem-solving strategies and tools, 3) **solves routine and non -routine problems involving multiplication without or with addition or subtraction of decimals and whole numbers including money using appropriate problem- solving strategies and tools**, and 4) **solves routine or non -routine problems involving division without or with any of the other operations of fractions and whole numbers using appropriate problem-solving strategies and tools**.

Teachers, with the support of their school administrators have employed two (2) strategies to address the concerns. These were **conducting LAC sessions** and **In-service trainings** that included mathematics in the pool of topics dished out during the conduct of these professional development activities in schools. In the 70-20-10 Principle of Learning, only 10% knowledge is absorbed by the participants in engaging themselves from these continuing professional development activities. Twenty percent knowledge is gained through participating in small group discussions and brainstorming. However, there is no acquisition of skill yet in both the 10% and 20%. It is purely acquisition of knowledge. This is the reason why Job-Embedded Learning (JEL) is highly encouraged for the participants. If they will fail to apply this 30% knowledge that they gained from their attendance to LAC sessions and In-service trainings to their respective stations/ classrooms, these will slowly deteriorate until eventually it will be forgotten.

Refugio et al. (2020) discussed the "Gibb's Reflective Cycle" as an advocate to help people learn from experience. It was highlighted in the theory that people can handle situations better in the future by reflecting on their past ones. The model consists of five stages where the last stage was into taking actions. This is the JEL part of learning.

Teachers tend to forget what they have learned from the LAC sessions and trainings when they will be bombarded with many issues and concerns other than the knowledge content and pedagogy when they returned to their respective classrooms. They need to be monitored and supervised by their school administrators to ensure that JEL will be put in place. That is why there are formative classroom observations, coaching, and mentoring in schools. These are followed through activities that will ascertain that teachers are truly applying the theories that they have gained from their attendance to LAC sessions and trainings.

With regard to addressing the challenges encountered by the learners in learning Mathematics 5, the strategies employed were as follows: 1) **conduct of remedial instruction**, 2) **provision of additional activities**, 3) **provision of vocabulary words**, and 4) **parents' conferencing**. However, if these strategies were repeatedly done in the previous years without evaluating whether these approaches have yielded better gains or not, still the efforts of the teachers are in vain.

In the Gibb's Reflective Cycle Theory, the third stage is "Evaluation". In this phase, the positive and negative aspects of the processes, thoughts, and feelings generated from the conduct of intervention activities are recorded. Positive and negative situations or experiences are noticed, rated, and examined separately. At this point, for instance, challenges, issues, problems, and obstacles in teaching Grade 5 Mathematics are supposedly discovered and addressed properly.

Conclusion

This study delved into the challenges encountered in teaching and learning Grade 5 Mathematics during the first two quarters of the 2022-2023 school year. The research aimed to identify the levels of challenges from both teachers' and learners' perspectives, explore the strategies employed to address these challenges, and design a strategic intervention to enhance the performance of learners in Mathematics.

The findings revealed that certain Most Essential Learning Competencies (MELCs) posed significant challenges for both teachers and learners. These challenges were particularly prominent in the areas of problem-solving, division, fractions, and decimals. The study highlighted the correlation between the challenges identified by teachers in teaching these specific MELCs and the difficulties faced by learners in learning them.

Teachers employed various strategies to address these challenges, including conducting Learning Action Cell (LAC) sessions, participating in in-service trainings, and implementing remedial instruction. Additionally, the study emphasized the importance of Job-Embedded Learning (JEL) to ensure that the knowledge gained in professional development activities is effectively applied in the classroom setting.

Moreover, the research acknowledged the crucial role of formative classroom observations, coaching, mentoring, and continuous evaluation in sustaining effective teaching practices. The study also shed light on the need for a reflective approach, such as the Gibb's Reflective Cycle, to assess the positive and negative aspects of intervention activities and address challenges systematically.

In response to the identified challenges, the study proposed a strategic intervention program tailored to narrow the learning gaps and losses among Grade 5 learners in Mathematics. This intervention includes a combination of targeted remedial instruction, provision of additional activities, vocabulary enhancement, and parent conferences.

This research contributes valuable insights to the ongoing efforts to improve Mathematics education in Grade 5, aligning with the objectives of the K–12 program in the Philippines. The findings and proposed intervention aim to support the Schools Division Office of Carcar City in achieving its goal of enhanced teaching and learning outcomes in Mathematics. As education continues to evolve, the outcomes of this study can serve as a foundation for future interventions and initiatives in addressing challenges in Mathematics education at the elementary level.

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