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Assessing Teacher Engagement and Effectiveness in Implementing Spiral Progression within Mathematics Curriculum: A Philippine Perspective

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Abstract

This study examines the status, performance, and challenges faced by secondary Mathematics teachers in implementing the spiral progression curriculum across eleven public secondary schools in Congressional District 2 (CD2) of Cagayan, Philippines, using a sequential explanatory design. Results indicate that teachers have a moderate understanding of spiral progression principles and content mapping but face significant implementation challenges. Student-related issues include lack of motivation, parental support, and continuity. Teacher-related problems involve inadequate training, limited instructional time, and overcrowded curricula, while school-related issues include insufficient instructional materials and mass promotion practices. The study recommends decongesting the Mathematics curriculum to enhance student mastery, promoting sustainable implementation programs, ensuring accurate dissemination of information, providing aligned learning materials, and integrating pedagogical training on spiral progression into the BSED Mathematics curriculum. These measures aim to improve the effectiveness and sustainability of the spiral progression approach in secondary Mathematics education.

Keywords: *Status, Implementation, Issues, Spiral progression, Mathematics*

Introduction

Mathematics holds a crucial place in a nation's socioeconomic growth, serving as the foundation for science, technology, engineering, research, and other critical disciplines. Mathematical algorithms enable the creation of systematic, reproducible, and transmittable knowledge essential for technological advancement, leading to the development of communication platforms that facilitate real-time interactions. Additionally, Mathematics has revolutionized project planning and development, making them more precise, efficient, and accurate through software applications in engineering. It also plays a vital role in economic forecasts, financial analysis, weather prediction, and reliable research interpretation. In daily life, Mathematics is integral to managing finances, time, and other activities, often without our conscious awareness.

Mathematics fosters critical thinking and problem-solving, which are highly valued 21st-century skills, along with communication and collaboration abilities (Rios et al., 2020). These skills are essential for meeting labor market demands and enhancing employability. A survey by the Organization for Economic Cooperation and Development (OECD) indicates that

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mathematical aptitude significantly influences life prospects, with higher proficiency linked to better job opportunities, higher salaries, and a greater likelihood of political engagement and trust in others (Abad & Arellano, 2020). Thus, Mathematics is integral to the development of a nation and its people.

Recognizing the need for mathematically proficient learners for economic growth, the Philippines undertook significant educational reform with RA 10533, the Enhanced Basic Education Curriculum. This reform extended basic education from ten to thirteen years to align with international standards, aiming to provide high-quality education and enhance the global recognition of Filipino graduates and professionals (Dizon et al., 2019). A key feature of the new curriculum is the spiral progression approach (SPA), where learning competencies are revisited with increasing complexity across grade levels, reinforcing prior knowledge and promoting mastery (Bruner, 1960).

In the context of Mathematics, the traditional disciplinary-based approach—Algebra in Grade 7, Geometry in Grade 8, Trigonometry in Grade 9, and Statistics and Probability in Grade 10—has been replaced by a curriculum that integrates Numbers and Number Sense, Measurement, Geometry, Patterns and Algebra, and Statistics and Probability throughout each grade level (K to 12 Curriculum Guide). This allows students to gradually master different branches of Mathematics. Studies indicate that spiral teaching positively impacts students' mathematical fluency, retention, and mastery (Hine, Blackley, & Cooke, 2019; Manalo & Yazon, 2020).

Despite these reforms, recent assessments reveal concerning results. In the 2019 Trends in International Mathematics and Science Study (TIMSS), Filipino 4th graders ranked last among 58 countries, with only 1% reaching a high international benchmark. Similarly, in the 2018 Programme for International Student Assessment (PISA), the Philippines ranked second-last in Mathematics out of 79 countries, scoring an average of 353 compared to the OECD average of 489. These results serve as a baseline for assessing the effectiveness of educational reforms and guiding policy development.

National assessments, such as the National Achievement Test (NAT) conducted by the Department of Education (DepEd), also indicate low proficiency in Mathematics among Grade 10 and Grade 12 students, with scores interpreted as "Low Mastery Level." Recommendations from these assessments focus on teacher training, localized materials, intervention development, and enhanced research instruction. However, they often overlook the underlying issues related to students' proficiency in problem-solving and critical thinking.

The 2022 PISA results echoed previous findings, with Filipino students scoring an average of 355 and ranking sixth lowest out of 81 countries. Only 16% of students achieved basic proficiency in Mathematics, highlighting a significant gap compared to their global counterparts. This indicates a need for five to six additional years of schooling for Filipino students to catch up.

These findings underscore the urgent need to address the shortcomings in the Philippine education system. While the K to 12 curriculum aims to provide quality education, international assessments reveal a persistent gap in student performance. This study aims to shed light on the implementation of the spiral progression approach in the Mathematics curriculum, focusing on the status, performance, and challenges faced by teachers. Existing research has predominantly explored the Science curriculum, making this study particularly relevant for understanding the Mathematics curriculum's implementation.Specifically, it sought answers to the following queries:

1. What is the profile of the Mathematics teachers in terms of the following variables:
   - 1.1. Age;
   - 1.2. Sex;
   - 1.3. Length of service;
   - 1.4. Position;
   - 1.5. Educational attainment;
   - 1.6. Field of specialization;
   - 1.7. Seminars/trainings attended; and
   - 1.8. Level of seminars/trainings attended?
2. What is the status of implementation of the spiral progression in Mathematics curriculum as perceived by the teachers along the following aspects:
   - 2.1. Lesson activities;
   - 2.2. Teaching strategies;
   - 2.3. Instructional materials; and
   - 2.4. Evaluation techniques?
3. What is the performance of the Mathematics teachers in the implementation of spiral progression of Mathematics along the following indicators:
   - 3.1. Level of understanding on the basic tenets of spiral progression;
   - 3.2. Knowledge on the mapping of content standards; and
   - 3.3. Job performance as to IPCRF?
4. What issues are encountered by the Mathematics teachers in the implementation of the spiral progression in Mathematics curriculum in terms of the following dimensions:
   - 4.1. Student-related issues;
   - 4.2. Teacher-related issues; and
   - 4.3. School-related issues?

METHODOLOGY

This study employed a sequential explanatory design to examine the status, performance, and issues faced by Mathematics teachers in implementing spiral progression. The research was conducted in eleven secondary schools within Congressional District 2 of Cagayan, including Abulug School of Arts (Abulug SOF), Abulug National Rural and Vocational High School (Abulug NRVHS), Alig Valley National High School (Alig Valley NHS), Allacapan Vocational High School (Allacapan VHS), Matucay National High School (Matucay NHS), Ballesteros National High School (Ballesteros NHS), Sanchez Mira School of Arts and Trades (Sanchez Mira SAT), Western Cagayan School of Arts and Trades (Western Cagayan SAT), Bidduang National High School (Bidduang NHS), Pamplona National School of Fisheries (Pamplona NSF), and David M. Puzon Memorial National High School (David M. Puzon MNHS).

The study's participants comprised 62 secondary Mathematics teachers with a minimum of one year of teaching experience in CD 2. They were selected through purposive cluster sampling. The respondents completed questionnaires adapted from Giray & Kim (2023) and Bartolome (2023) to evaluate the status and issues of implementing spiral progression and assess teachers' performance, respectively.

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Prior to data collection, a letter detailing the study's objectives and procedures was sent to the relevant authorities to secure permission. Teachers were informed about the study's goals, the estimated time for questionnaire completion, the confidentiality of their responses, and their voluntary participation rights. The primary data collection involved administering a set of questionnaires to the teacher-respondents. Once the quantitative data were gathered, they were tabulated and analyzed. Following the quantitative analysis, focus group discussions (FGDs) were conducted with randomly selected teacher-respondents to validate the results and provide deeper insights. These discussions further investigated the data collected through the initial survey.

Four sets of research instruments were used. The first set was a survey that collected demographic and professional information about the teachers. The second set, adapted from Giray & Kim (2023), used a four-point Likert scale to assess the status of spiral progression implementation across four indicators: learning activities, teaching strategies, instructional materials, and evaluation techniques. The third set, also adapted from Giray & Kim (2023), identified challenges in implementing spiral progression, categorized into student-related, teacher-related, and school-related issues. The fourth set, adapted from Bartolome (2023), evaluated teachers' performance in implementing spiral progression. It included a binary test (true/false) to assess understanding of spiral progression's basic tenets, a content mapping knowledge test to determine teachers' familiarity with the appropriate grade levels for various learning competencies, and an Individual Performance Commitment and Review Form (IPCRF) rating to gauge overall teacher performance.

After the data collection, quantitative data were analyzed to identify trends and correlations. Qualitative data from the FGDs were used to validate and enrich the quantitative findings, providing a comprehensive understanding of the issues and performance related to the spiral progression implementation. The combined analysis offered robust insights into the teachers' status, performance, and encountered challenges.

RESULTS AND DISCUSSION

After the thorough analysis and interpretation of data gathered from the respondents, this study presents the result of the study together with the perceived inferences of the results.

Table 1. Profile of the secondary Mathematics teachers

Profile Variables	Frequency (n = 62)	Percentage
Age (in years)		
56 to 63	5	8
48 to 55	9	15
40 to 47	13	21
32 to 39	17	27
24 to 31	20	32
	Mean = 38.3 y/o	**S.D. = 10.2**
Sex		
Male	24	39
Female	38	61
Length of service		
35 to 41	1	2
28 to 34	6	10
21 to 27	4	6
14 to 20	8	13
7 to 13	15	24
1 to 6	27	45
	Mean = 11.3 years	**S.D. = 9.65**
Teaching position		
Teacher I	13	21
Teacher II	12	19
Teacher III	31	50
Master Teacher I	5	8
Master Teacher II	1	2
Educational attainment		
College graduate	9	14
Units in Master's Degree	25	40
Master's Degree Graduate	21	34
Units in Doctorate Degree	6	10
Doctorate Degree Graduate	1	2
Field of specialization		
Mathematics	60	97
Non-Mathematics	2	3
Number of trainings attended		
1	37	60
2	11	17
3	8	13
4	3	5
5	3	5
	Mean = 2	**S.D. = 1**
Level of trainings attended		
School-based	10	**16**
District	16	**26**
Division	15	**24**
Regional	12	**19**
National	9	**15**

Table 1 presents the distribution of the teacher-respondents according to their profile variables: age, sex, length of service, position, educational attainment, field of specialization,

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seminars/trainings attended, and level of seminars/trainings attended.

It can be seen in the table that most of the teachers are aged 24 to 31 years old, with the highest frequency of 20 or 32 percent, while 17 or 27 percent are aged 32 to 39 years old. It can be noted that only 5 or 8 percent constitute 56 to 63 years old. Moreover, the result showed that the mean age of the teachers is 38 years old, with a standard deviation of 10.2. Thus, data shows that most of the teachers fall in early adulthood, who are believed to be in the stage of developing or establishing their careers and having a family as part of the developmental tasks in this stage identified by Havighurst (1972). Hence, it is most likely that they have divided attention between performing their work and playing their family roles.

Regarding the sex of the teachers, 38 or 61 percent are females, outnumbering the males with 24 or 39 percent. This finding means that there are more female teacher-respondents than males, consistent with OECD data in 2019, wherein at the secondary level, 64 percent of the total teacher population comprised of females attributed to gender stereotypes, flexibility that allows to combine and family responsibilities, and wage levels are the same for both men and women making it female-dominated profession.

Moreover, the teacher's length of service has an overall mean of 11.37 years and a standard deviation of 9.68, wherein among 62 teacher-respondents, 27 or 44 percent has been teaching for 1 to 6 years, while the same frequency of teachers with 15 or 24 percent has been teaching for 7 to 13 years and 21 to 27 years, and 1 or 2 percent of them has been in service for 35-41 years. Thus, in terms of experience, most teachers are considered novice teachers, which is an advantage in implementing the K to 12. As cited by Camino (2020), teachers new to the service are more open to new experiences than teachers with more years of experience. He further elaborated that as teachers aged in service, they tend to be complacent about what they have and how things used to be.

In addition, it is apparent in the table that most teachers are Teacher III, consisting of 31 or 50% of the total number of respondents. The same frequency count of 12 or 19 percent are Teacher I and Teacher II, 5 or 8 percent are Master Teacher 1, and only 1 or 2 percent are Master Teacher II. This finding implies that most teachers have already elevated their position from Teacher I, which coincides with the results showing that most teachers pursued their graduate school studies. Under DepEd Order No. 7, s.2023, one of the qualification standards for promotion in DepEd is education.

Parallel to this, among 62 respondents, the highest frequency of 24 or 39 percent accounts for the teachers with units in Master's Degree, while 21 or 34 percent are Master's Degree holders. In addition, data show that 6 or 10 percent of the teachers are pursuing a Doctorate Degree, 1 or 2 percent are a Doctorate Degree holder, and only 9 or 15 percent are college graduates. Overall, most teachers have pursued graduate education, tallying to a total frequency of 53 or 85 percent. Related to this, the study by Abellana & Abadiano (2020) revealed that teachers take their graduate school studies to improve teaching competence, boost self-confidence and self-fulfillment, and for promotion, which is positively associated with students' achievement.

Regarding the field of specialization, the teachers-respondents are Mathematics majors dominated with the frequency of 60 or 97 percent, while only 2 or 3 percent constitute the Non-Mathematics majors. It means that almost all of the teachers received the necessary orientation on principles of Mathematics teaching, and they are knowledgeable in teaching different branches of Mathematics.

Furthermore, it is interesting to note that the highest number of trainings that teachers attended since the implementation of the K to 12 curriculum is five (5) participated with only 3 or 5 percent of the 62 teacher-respondents, while most of them with the highest frequency of 36 or 58 percent has attended only one (1) training which they indicated as the In-Service Training for Teachers (INSET).

In congruence, most of the teachers' highest level of training is at the district level, accounting for a frequency of 16 or 26 percent, followed closely by division level with 15 or 24 percent, and 9 or 15 percent attended the national level. In conclusion, all of the teachers have attended at least one training. However, considering the transition of content and pedagogy in implementing spiral progression, it is also apparent that there is a need for additional training for teachers. Orale and Uy (2018) pointed out that training inadequacy is one factor that prevents teachers from producing favorable outcomes of the spiral progression approach.

Table 2a. Status of implementation of spiral progression in Mathematics curriculum in terms of learning activities

Statements	Weighted Mean	Descriptive Value
1. There is more integration of various concepts on each topic encountered.	3.24	Always
2. The lessons are extended in a more elaborate and comprehensive teaching style.	3.35	Always
3. There is an integration of knowledge and skills across different disciplines.	3.48	Always
4. The topics discussed in the previous years are pre-requisite for those topics in the current year. Thus, they are reviewed before a new topic is introduced.	3.58	Always
5. There is continuity of lessons in the same Math concept in all grade levels.	3.56	Always
6. The lessons which cover the same topics in other grade levels are presented at varying levels of complexity.	3.52	Always
7. The information the students have acquired about a topic is reinforced and deepened as they revisit the subject matter.	3.32	Always
8. The learning experiences exposed the students to a wide variety of	3.32	Always

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concepts/topics, skills, and attitudes deemed of "continual concern of everyone" until they are mastered.		
9. Learners learn topics and skills appropriate to their developmental/cognitive stages.	3.39	Always
10. Learners are provided with activities or projects developing their thinking skills and dispositions, which do not stop at identification but facilitate implementation of the desired performance.	3.48	Always
Overall Weighted Mean	**3.46**	Always

Table 2a reflects the status of implementing spiral progression in the Mathematics curriculum in terms of learning activities. The table shows that the learning activities provided to the students were *always* based on the principles of the spiral progression approach, with an overall weighted mean of 3.46. The teachers reported that learning activities given to the students *always* include topics discussed in the previous years because they are prerequisites for the topics in the current year, with a weighted mean of 3.58. Moreover, data shows that the teachers *always* implement activities that ensure "continuity of lessons in the same Math concept in all grade levels" and "with varying levels of complexity," garnering a mean of 3.56 and 3.52, respectively. In contrast, they *often* ensure that learning activities have "more integration of various concepts on each topic encountered." Significantly, the status of the implementation of spiral progression in terms of learning activities aligns with the elements of spiral progression of Johnston (2012): re-visit of themes several times, increasing difficulty level, and the linkage of prior knowledge to current topics.

Table 2b. Status of implementation of spiral progression in Mathematics curriculum in terms of teaching strategies

Statements	Weighted Mean	Descriptive Value
1. I prepare every Math lesson and the curriculum with a proper blending of concepts, skills, and values and appropriately sequenced them from the start upward according to the difficulty level.	3.61	Always
2. In preparing the lesson, I always check on what the students have previously learned and reflect on what "prior knowledge" is needed by the students for the new lesson to be presented to them.	3.74	Always
3. When presenting a new lesson, I associate them with the basic concepts that were previously discussed and re-emphasized them many times to help the students master them.	3.79	Always
4. I present topics and skills appropriate to students' developmental/cognitive stages.	3.73	Always
5. As learning progresses, I present topics in a more detailed way wherein topics are progressively elaborated, leading to a broadened understanding and knowledge transfer.	3.73	Always
6. I present key concepts repeatedly throughout the curriculum to let the students reinforce what they have previously learned but with deepening levels of complexity.	3.61	Always
7. I encouraged the students to apply what they have previously learned to the topics being discussed at present.	3.76	Always
8. I provide linkages between each lesson as the students "spirals upwards" in a course study to help them see the connections among the lessons.	3.53	Always
9. I expose the students to a wide variety of concepts/topics, skills, and attitudes that are deemed of "continual concern to everyone" until they are mastered.	3.53	Always
10. I construct lessons, activities, or projects that target the development of thinking skills and dispositions which do not stop at identification but instead facilitate implementation of the desired performance.	3.52	Always
Overall Weighted Mean	**3.65**	Always

Table 2c presents the extent of the implementation of spiral progression in the Mathematics curriculum in terms of instructional materials. As denoted by the overall weighted mean of 3.06, the teachers *often* utilized instructional materials consistent with the principles of spiral progression. Results revealed that the teachers *always* "use the learner's/self-learner's module and books as a reference for the lesson and activities" (3.61) and *always* "use multimedia materials like videos, PowerPoint, Prezi, and Movies in teaching Math lessons" (3.27). On the other hand, teachers *often* use software applications like Geogebra, MS Excel, and SPSS to elaborate math lessons and mathematics manipulatives like math tiles to teach math concepts, with a mean

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of 2.71 and 2.81, respectively. These results parallel Giray and Kim (2023) findings that teachers mostly rely on the learner's module, which can be attributed to the lack of books and other printed materials in Mathematics anchored in spiral progression. During the focused group discussion with the respondents, they shared that their reference books are either books used in the old curriculum or books they bought from private companies. Thus, the unavailability of learning materials is still one of the challenges experienced by teachers, which sometimes limits the activities and depth of discussion.

Table 2d. Status of implementation of spiral progression in Mathematics curriculum in terms of evaluation techniques

Statements	Weighted Mean	Descriptive Value
1. I use pencil and paper tests to measure students memorized knowledge and levels of understanding.	3.68	Always
2. I use visual displays like photographs, diagrams, tables, charts, and models to assess students' analytical thinking skills and grasp of the lesson presented to the class.	3.11	Often
3. I let my students do reflection note allowing them to write down their experiences, learnings, difficulties and thoughts about the lessons discussed.	2.84	Often
4. I let my students have a simple research report presentation to let them apply their knowledge and understanding of a topic.	2.68	Often
5. I use performance-based assessments like producing a product and performing an activity for them to showcase what they know and can do.	3.15	Often
6. I use problem-solving activities to gauge students' conceptual understanding of the theory-practice relationship, their higher-level reasoning skills, and the development of their practical competence in solving problems.	3.32	Always
7. I give my students a group/peer assessment to help them develop skills specific to collaborative efforts, allowing them to tackle more complex problems than they could on their own, delegate roles and responsibilities, and share diverse perspectives about the lesson.	3.45	Always
8. I give my students a self-assessment to let them reflect on how their work meets the goals set for learning concepts and skills.	3.39	Always
9. I provided my students with checklists and rubrics to help them understand and meet the expectations as they worked on their assigned tasks and assignments.	3.24	Often
10. I give my students formative assessments for me to know the concepts the students are struggling to understand, skills they are having difficulty acquiring, or learning standards they have not yet achieved so that adjustments can be made to lessons, instructional techniques, and academic support.	3.55	Always
Overall Weighted Mean	**3.28**	Always

Apparent in Table 2d is the extent of implementation of spiral progression in the Mathematics curriculum in terms of evaluation techniques. It can be gleaned from the table that the teachers *always* use pencil and paper tests (3.68) and problem-solving activities (3.32) and *often* use performance-based assessments (3.15) to evaluate students' learning. In contrast, formative assessments are *always* used as assessments for learning that focus on providing interventions for learners' difficulties. Moreover, the teachers *always* use group/peer assessment (3.45) along with self-assessment (3.39) and *often* use writing reflection notes (2.84) in assessment as learning, involving the students in the assessment process for them to reflect on their performance. Overall, the teachers *always* practice evaluation techniques in adherence to spiral progression with an overall weighted mean of 3.28, wherein they utilize various evaluation techniques appropriate for the assessment. As stipulated in DepEd No.8, s. 2015, the purpose of assessment is to monitor students' progress, promote self-reflection and accountability among learners, and provide bases for profiling student performance on the learning competencies and standards of the curriculum.

Table 3. Performance of Mathematics Teachers in implementing spiral progression

Performance Indicators	Frequency (n = 62)	Percentage
Basic Tenets		
Outstanding (80 – 100)	8	13
High (70 – 79)	22	35
Moderate (60 – 69)	24	39
Passable (50 – 59)	3	5
Insufficient (below 50)	5	8
	Mean = 66 S.D. = 12.5	**Moderate**
Content Standards		

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Outstanding (80 – 100)	14	23
High (70 – 79)	9	15
Moderate (60 – 69)	14	23
Passable (50 – 59)	7	11
Insufficient (below 50)	18	29
	Mean = 60 S.D. = 18.8	**Moderate**
IPCRF Rating		
Outstanding (4.500 – 5.000)	58	94
Very Satisfactory (3.500 – 4.499)	3	5
Satisfactory (2.500 – 3.499)	1	2
Fairly Satisfactory (1.500 – 2.499)	-	-
Poor (below 1.499)	-	-
	Mean = 4.69 S.D. = 0.273	**Outstanding**

The performance of Mathematics Teachers in implementing spiral progression in terms of basic tenets, knowledge of the mapping of content standards, and job performance based on the IPRCF rating is reflected in Table 3.

The teachers' performance in terms of the basic tenets of spiral progression falls mainly in the moderate level of achievement of 60 to 69 percent with the frequency of 24 teachers or 39 percent, and 22 or 35 percent belongs to a high level (70 – 79). However, out of the 62 teachers, only 8 or 13 percent achieved an outstanding level, garnering a score of 80-100, while five (5) teachers, or 8 percent, have insufficient achievement of curriculum expectations. Overall, the mean percentage score of the teachers' performance regarding the basic tenets of spiral progression is 60, interpreted as a moderate level with a standard deviation of 12.5. Findings imply that the teachers have a moderate level of understanding of the basic principles of spiral progression, which is in harmony with the study of Bartolome (2023).

In parallel, the teachers have a moderate level of performance in terms of their knowledge of the mapping of content standards, with a mean percentage score of 60 and a standard deviation of 18.8. Among the 62 teachers, the majority of 18 or 29 percent have insufficient achievement levels, scoring below 50 percent, whereas 14 or 23 percent have outstanding performance, 9 or 15 percent have high performance, and 14 or 23 percent achieved moderate level. The findings imply that many Mathematics teachers do not fully grasp the learning competencies that must be taught in each grade level. Bartolome (2023) associated this with teachers' poor understanding of the mathematics curriculum, which may be attributed to the inadequacy of teacher training, as shown in Table 1. Similarly, during the FGD, the teachers commented that the Mathematics curriculum guide was overcrowded. In effect, they can only cover some of the learning competencies in a year, requiring teachers in higher grade levels to teach the uncovered competencies because these are prerequisites.

Significantly, regarding the IPCRF rating of the teachers, almost all of them have outstanding performance (4.500 – 5.000), tallying a frequency of 58 or 94 percent, whereas 3 or 5 percent have a very satisfactory rating and only 1 or 2 percent have a satisfactory rating. It means that the teachers perform well based on the indicators in the IPCRF.

Table 4. Issues in implementing spiral progression

Themes	Categories	Actual Response
Student-related issues	**Lack of motivation**	Teacher 2: *Students nowadays are very complacent. They only review during summative tests.* Teacher 3: *Students are more interested in extra-curricular activities. They tend to easily forget the lessons.* Teacher 5: *At present, students want an instant answer. They have very short span of attention and they easily get bored when are given challenging Math tasks.*
	Lack of parental support	Teacher 4: *Parents of coping learners usually do not attend teacher and parents conference. They are confident that their children will pass.* Teacher 5: *Some of the students do not have knowledgeable others at home who can help them.*
	Broken spiral	Teacher 3: *I observed that one of the least mastered competencies is operation of integers, a Grade 6 competency.* Teacher 4: *If I will teach the prerequisites of every lesson, the competencies I have to teach will be compromised.* Teacher 5: *I have students who do not know how to multiply and divide, but I have to introduce operations of functions.*
Teacher-related issues	**Limited training**	Teacher 1: *As a novice teacher, I have difficulty applying spiral progression in teaching because it is not my training when I was in college.* Teacher 2: *There are very limited training in Mathematics, and if there is, there is only one slot allotted for*

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		each school. Teacher 4: *In my four years of teaching, I have attended only one training related to Mathematics.* Teacher 5: *Since the implementation of spiral progression, I remember that there was only 1 mass training for senior high school teachers.*
	Overcrowded learning competencies	Teacher 2: *The idea of spiral progression is promising, but there are too many competencies.* Teacher 3: *With other school activities and class disruptions, I have not yet experience discussing all the competencies in a year since the implementation of K to 12.* Teacher 4: *Sometimes, I just select the learning competencies that I believe they will need in higher grade levels.*
	Reduction of instructional time	Teacher 1: *I always have to allot one hour of instruction to review previous lessons because students forget it.* Teacher 4*: There are times that I have to teach prerequisites because they were not covered in previous grade level.*
School-related issues	**Mass promotion**	Teacher 1: *I have never dropped or retained a student in my class. At the end, I will be asked what intervention have I done, and it seems like it's my fault.* Teacher 2: *I better pass the students than conducting remedial classes or being questioned of the grade I give.* Teacher 3*: I am a Senior High School teacher, but non-numerates students have been promoted to this grade. They do not know how to multiply and divide.* Teacher 5: *My principal told me not give grades lower than 74. If possible the lowest is 80.*
	Scarcity of learning materials	Teacher 1: *Poor internet connection limits educational technologies that can be integrated.* Teacher 2: *There are no available textbooks in Grade 7 aligned to spiral progression.* Teacher 4: *I bought my references in private companies, but sometimes, I am using the old textbooks.*

Student-Related Issues

Table 4 displays the issues of teachers in implementing spiral progression, which emerged in the focus group discussion.

First, three student-related factors were identified: lack of motivation, parental support, and broken spiral. Lack of motivation to learn has been a perennial problem faced by Mathematics teachers. It is a learning barrier that hinders the learners' interests and contributes to the perceived difficulty of the subject. Accordingly, Arthur, Dogbe and Asiedu-Addo (2022) state that Mathematics learning motivation and students' interest in Mathematics are positively correlated, which means that learning motivation directly affects the students' interests. Similarly, Habibullah, Durahim, et al. (2022) revealed a positive relationship between students' motivation and learning outcomes in Mathematics, implying that when students' motivation decreases, their learning outcomes follow.

Moreover, another issue experienced by teachers in implementing spiral progression is the lack of parental support. Students' learning is a shared responsibility of teachers and parents. The more parental support the students get from their parents, the better their academic achievement (Yieng, Katanga, et al., 2019). However, teachers indicated that some parents, specifically parents of coping learners, do not usually attend parent-teacher conferences as they are busy making ends meet.

Notably, the broken spiral is the most alarming issue discussed during the focus group discussion. In the spiral progression approach, a broken spiral happens when students do not gain mastery of previous topics but are introduced to more complex ones (Orale & Uy, 2018). Hence, a broken spiral is the opposite of the aim of spiral progression. Instead of progressively gaining mastery of concepts, the broken spiral is the case of students who do not fully grasp previous lessons but need to learn the current competencies. With the teachers' comments, this is the current scenario in primary education today. Although teachers allot time to review past lessons, they can only teach a little because there is a limited time to teach every learning competency. The same findings were shown in the study of Orale and Uy (2018), disclosing evidence that students' performance is not spiraling. Their study revealed that most of the student-respondents about to move to Grade 11 are still beginners in Grade 7, Grade 8, and Grade 10 Mathematics, meaning they were promoted without attaining the expected level of mastery.

Teacher-Related Issues

Inadequate training, limited appropriate teaching strategies, and overcrowded learning competencies were the teacher-related issues emphasized during the FGD. Teachers reported that although the government provides training, only a few can attend it because usually, there is a 1 school-to-1 teacher-participant ratio. Orale and Uy (2018) identified inadequate training as one factor that prevents

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teachers from producing favorable outcomes. Moreover, Resurrection and Adanza (2015) confirmed in their study that teachers need more time and training to be equipped with new strategies. In congruence, Balinario (2021) concluded in his study that training, enhancement programs and procurement of instructional equipment are needed to meet K to 12 curriculum standards.

Furthermore, the teachers lamented that too many learning competencies are required to be discussed per grade level. With students' participation in other school activities and unprecedented class disruption, the teachers confessed that they have never tried covering all the competencies in a year, recognizing that this affects the student's performance in the next grade level. As suggested by Robertson (2021), Senior Research Fellow at the Assessment Research Centre, University of Melbourne, the curriculum needs decongestion as it requires students to study too many competencies, affecting their capability to master basic concepts. Further, the findings of Abad and Arellano (2020) stated that problems encountered in spiral progression are the rapid transition between concepts and the failure to provide a solid foundation because many topics were covered. Giray and Kim (2023) suggested that equipping teachers with essential subject content knowledge and skills to effectively and efficiently deliver instruction improves the spiral progression implementation.

Linking the previous lesson to the existing one is a core element of spiral progression. Ironically, the issue of instructional time reduction stemmed from it as a part or sometimes a whole period allotted for instruction is spent to review or reteach previous lessons depending on students' prior knowledge, consequently creating a domino effect on the learning competencies covered and the amount of learning that will take place. In effect, teachers are confused and indecisive about the focus of their discussion. In agreement, Dhunny and Angateeah (2019) stated that the subsequent reduction of instructional time spent reviewing previous lessons is a significant challenge in implementing spiral progression. Nevertheless, Gabriel, Nepomuceno, et al. (2022) emphasized the need to review the un-mastered basic and foundational competencies necessary to learn high-level Mathematics, thereby addressing the gap in students' attainment of foundational competencies and specified competencies in their grade level.

School-Related Issues

Mass promotion practice in the DepEd has been a center of discussion among lawmakers, policy implementers, and experts. DO No. 13, s of 2018 outlines the guidelines for conducting remedial and advancement classes, wherein students who have failed in not more than two learning areas are required to take remedial classes, while students are retained when they failed in more than two learning areas. However, while the agency denies the existence of such policy, systems and policies implemented by the government like the "No Filipino Child is Left Behind" and the "Philippine Education for All 2015 National Plan of Action," are interpreted as mass promotion among teachers (Orale & Uy, 2018), which are becoming roots of issues in implementing spiral progression. The teachers reported that the learning attitude of complacency and lack of motivation of the learners and the parents are attributed to the thought that they pass regardless of their performance. The teachers agree that passing the coping learners is easier than facing the consequences. As stated by the teachers, they passed the students to avoid further explanations and to be free from additional paperwork. Clearly, the teachers' experiences provide evidence of miscommunication of educational policies, and it is very concerning as their responses show that 80 is becoming the passing grade, the equivalent of 75. Congruent to this are the findings from the study conducted by Vilches (2018), showing that the flow of communication between people and levels of the education system is one of the challenges that Filipino teachers experienced in implementing the K to 12 curriculum, asserting that curricular change is a continuous process. The same findings were revealed by Bongco & David (2020), expressing that teachers need not only accessibility of information but also sufficiency and quality, opposite to the assumption that curriculum implementers automatically understand policy details. Furthermore, Orale and Uy (2018) recommended that making remedial classes more attractive to teachers may improve the agency's present assessment and promotion scheme.

Researches show a positive correlation between teaching with instructional materials and students' academic performance in Mathematics (Uwitatse et al., 2023) and positive attitude and high self-efficacy beliefs among high school students (Prado & Tan, 2019). However, it is evident from the teachers' responses that learning materials are scarce, wherein they specified that they buy their textbooks or use self-learning modules to deliver instruction to the students. Parallel to this result is the finding of the study of Mendiola & Estonanto (2022), stating that teachers developed their own instructional materials, affecting the depth and breadth of instruction. Thus, this study recommends that the government provide adequate learning materials to improve the implementation of spiral progression.

Conclusions

Based on the findings of this study, several conclusions can be drawn regarding the status and performance of Mathematics teachers in Congressional District 2. The majority of these teachers are in their early adulthood, with a female predominance, and many are relatively new to the profession, holding Teacher III positions. A significant number are engaged in continuous professional development, often pursuing a Master's Degree, and have mainly participated in district-based training. This demographic indicates a dynamic and evolving workforce in the region. The implementation of spiral progression in Mathematics is generally well-executed, with teachers effectively designing learning activities, employing diverse teaching strategies, using appropriate instructional materials, and applying robust evaluation techniques. Teachers exhibit a moderate understanding of the basic principles of spiral progression and content standard mapping, yet their performance is exceptional according to IPCRF indicators, reflecting a strong commitment to educational standards. However, several challenges hinder the effective implementation of spiral progression. These include a lack of learner motivation, insufficient parental support, instances of broken spirals, limited teacher training, constrained instructional time, overcrowded learning competencies, the practice of mass promotion, and inadequate instructional materials. Addressing these issues is crucial for enhancing the overall effectiveness of the spiral progression approach and improving student outcomes in Mathematics.

Recommendations

In light of the findings and conclusions of this study, the following comprehensive recommendations are highly advocated: The

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Department of Education should prioritize the decongestion of learning competencies within the Mathematics curriculum, aiming to enhance learners' mastery and coverage of essential concepts. Additionally, the department must intensify promotion efforts for programs and activities aimed at bolstering the sustainability and efficacy of spiral progression, including widespread dissemination of information to ensure accurate implementation and provision of suitable learning materials aligned with spiral progression standards. Moreover, the Commission on Higher Education should incorporate pedagogical training in teaching Mathematics concepts aligned with spiral progression into the Bachelor of Secondary Education (BSED) Mathematics curriculum. Schools ought to foster stronger partnerships with students' parents through consistent communication strategies and increased parental involvement in school activities. Teachers should actively pursue continuous professional development, while school administrators must initiate programs that empower teachers with the requisite knowledge and skills to cater to learners' needs and meet curriculum standards effectively. Finally, future researchers are encouraged to conduct similar studies to generate additional literature aimed at enhancing the Mathematics curriculum further.

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