

## TEACHERS AND STUDENTS' LIVED EXPERIENCES IN THE IMPLEMENTATION OF SPIRAL PROGRESSION APPROACH IN MATHEMATICS



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### ABSTRACT

Employing the methodology of descriptive phenomenology, this research investigated the perspectives and firsthand experiences of teachers and students regarding the adoption of the spiral progression approach (SPA) in teaching and learning mathematics. The study involved participants from junior high schools within the Division of Tuguegarao City. The findings indicated a varied range of viewpoints regarding the effectiveness of the SPA in mathematics instruction. While some individuals held a positive view, recognizing its merits and positive impact, others expressed skepticism and identified challenges associated with its implementation. The experiences of both teachers and students in the domain of mathematics education were characterized by difficulties, shaped by curriculum, teacher, student, and school-related factors. Remarkably, the successful integration of the SPA into mathematics education was strongly influenced by the presence of a supportive school culture, comprised of essential elements that collectively fostered an environment conducive to effective SPA implementation and enhanced learning outcomes. The insights obtained from the lived experiences of teachers and students provide valuable insights for educators and policymakers to make well-informed decisions and adjustments, aiming to maximize the benefits and mitigate the limitations of utilizing the SPA in mathematics education.

**Keywords:** spiral progression approach, lived experiences, K-12 curriculum

## 1. INTRODUCTION

### *Background of the Study*

Education holds the hopes of societies worldwide, prompting governments to invest in their citizens' learning. These investments are indispensable, serving as a vital factor in equipping individuals with essential knowledge, skills, and values crucial for personal, national, and global advancement. Education not only enhances production, talent, and virtues, but also fosters individual personality, human resource development, and social integration, ultimately transforming individuals capable of resource management at personal and national levels for sustainable development. In the pursuit of educational

excellence, the Philippine legislature has introduced the K-12 Basic Education Curriculum as a significant reform to enhance learners' mastery of fundamental competencies from kindergarten to year 12. This curriculum, with pathways for higher education, employment, entrepreneurship, and middle-level skills, aims to make Filipino learners globally competitive, aligning with the government's commitment to ASEAN integration and internationalization efforts.

A key aspect of the K-12 curriculum is the spiral progression approach (SPA), which aids teachers in designing lessons, activities, or projects to foster students' deeper comprehension of concepts rather than mere recognition. Advocates of SPA highlight its role as a motivational tool that enhances learning by bolstering topic retention and mastery through teaching the same subjects with increasing complexity across grade levels, presented in a simple-to-complex manner. In the context of the K-12 curriculum, mathematics employs SPA to enhance the mathematical proficiency of Filipino learners, acknowledging its indispensable role in national development due to its applications in technology, engineering, communications, and more. In the 21st century, the demand for mathematics skills is undeniable, driven by its increasing relevance across industries and its contribution to innovative advancements that enhance human activities' efficiency and effectiveness.

Numerous international and domestic studies highlight a concerning decline in the mathematics proficiency of Filipino learners. The Program for International Student Assessment (PISA) report by OECD in 2018 indicated that Filipino students ranked second lowest in mathematics and science proficiency (Paris, 2019), with only 19.7% reaching the minimum proficiency level (Level 2) in Mathematical Literacy. Similarly, the Philippine Institute for Development Studies reported in 2020 that some senior high school students struggled with numeracy skills and basic English language proficiency. The recent Department of Education's Basic Education Exit Assessment (BEEA) results indicated poor scores for high school students in mathematics and science, marking the lowest national assessment performance (Albano, 2020). Locally, research found that K-12 graduates were not adequately prepared for college, particularly in mathematics and science, with the lowest scores of 16% and 14.5% respectively in the College Readiness Test (Tamayao et al., 2019). This aligns with the 2019 National Achievement Test, where learners demonstrated low proficiency in mathematics and science (DepEd, 2020).

The pressing need to enhance mathematics proficiency among Filipino learners is accompanied by a critical examination of the effectiveness of the SPA within the K-12 curriculum. While studies worldwide offer differing perspectives on SPA's efficacy, it has proven beneficial in the United States as an instructional method, improving students' motivation and grasp of mathematical concepts (Gamoran, 2011). However, Philippine studies yield contrasting results; research highlights that half of the tested mathematical content remained least mastered among Grade 8 students, and no significant correlation was found between perceived factors affecting the SPA curriculum and students' academic performance (Capate & Lapinid, 2015; Merza et al., 2018). To address these discrepancies, this study aims to explore the experiences of teachers and students implementing SPA in the Division of Tuguegarao City. While previous studies have predominantly focused on quantitative aspects of SPA, few have delved into firsthand experiences of its users, leaving teachers and students'

perspectives largely unexplored. By unraveling these experiences, the study aims to reveal the effectiveness, merits, challenges, and facilitators of SPA, ultimately contributing to capacity-building measures for teachers and improved student learning outcomes in mathematics, which is a pressing concern in the Philippines.

### *Objectives of the Study*

This study examined the teachers and students' perception, lived experiences, as well as the enabling and restraining factors in the implementation of the spiral progression approach (SPA) in teaching and learning mathematics.

### *Conceptual Framework*

The decline in mathematics proficiency among Filipino learners raises national concerns, emphasizing the urgent need for improvement, as mathematics plays a crucial role in national development. Individuals with strong math skills are more likely to contribute to innovation and development, while those lacking such skills face limited opportunities (Abad & Arellano, 2020; Van del Wart, 2016). In the Philippines, the Spiral Progression Approach (SPA) is legally integrated into mathematics education through Republic Act No. 10533, the Enhanced Basic Education Program or K-12 Program, implemented since 2013-2014. However, with nine years of SPA implementation, the need for evaluation becomes apparent, a stance supported by Camara (2020) who advocates reviewing the approach's effectiveness, particularly considering cases where similar approaches were eventually removed from educational systems (Camara, 2020).

The utilization of SPA is seen by K-12 Curriculum developers as a potential avenue for enhancing mathematics teaching and learning in the country, addressing the consistent underperformance of Filipino learners. However, despite growing quantitative studies on SPA, few papers explore it from a qualitative perspective, particularly through the firsthand experiences of teachers and learners. To address this gap, the study aims to uncover teachers' and students' experiences using SPA for mathematics education in Tuguegarao City's Division. Guided by various assumptions, the research aims to reveal how these experiences influence attachment to mathematics, engagement, attitudes, and the effective use of SPA, taking into account enabling factors, challenges, advantages, disadvantages, and coping mechanisms, ultimately contributing to more effective teaching and learning practices.

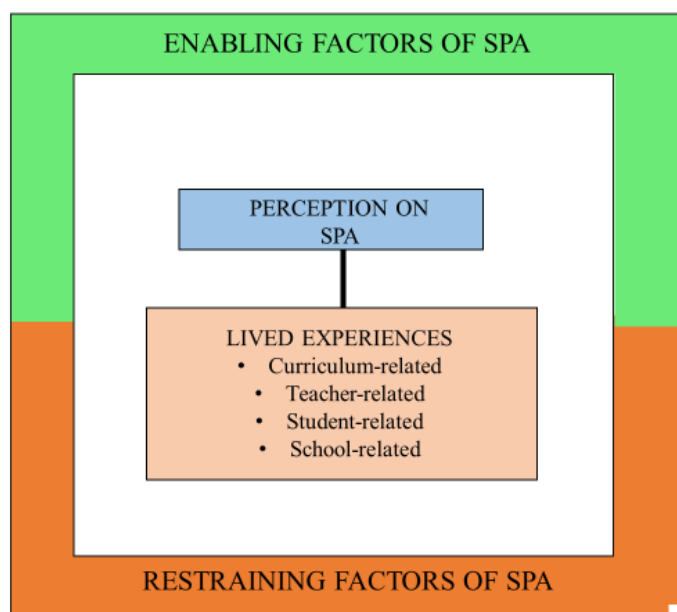


Figure 1. Paradigm of the Study

The diagram in Figure 1 illustrates that the lived experiences of teachers and students engaged in implementing the SPA are influenced by a complex interplay of curriculum, teacher, student, and school-related factors. Curriculum-related factors encompass content, learning materials, guides, continuity, time allocation, and learning objective achievement. Teacher-related aspects involve knowledge, skills, and best practices in teaching mathematics with SPA, while student-related factors include competency retention, motivation, confidence, and learning style. School-related factors encompass technical support, resources, facilities, and training for competency enhancement in using SPA. Alongside these factors, there are enabling and restraining forces, all shaping the experiences. Enabling factors facilitate effective SPA implementation, whereas restraining factors hinder it. By uncovering participants' lived experiences, this study aims to design teacher enhancement training to enhance effective SPA implementation and subsequently improve students' academic performance in mathematics.

### *Significance of the study*

Exploring the lived experiences of teachers and students using the SPA in mathematics teaching and learning holds relevance for various stakeholders involved in upholding educational quality, both nationally and in Tuguegarao City. The study's outcomes are valuable to the Department of Education (DepEd) for evaluating SPA's implementation and identifying areas for improvement, leading to better learning outcomes. School administrators and supervisors can use the results to understand the advantages, disadvantages, and enabling factors of SPA, aiding in capacity building and curriculum enhancement. Learners stand to benefit by gaining insights into their experiences and coping mechanisms, facilitating stress management and effective learning strategies.

For teachers, the study offers a chance to reflect on their experiences, perceptions, and coping mechanisms related to SPA, potentially fostering a positive outlook and improved teaching strategies. Master teachers can leverage the findings to provide

meaningful mentorship and technical assistance, while parents gain insight into their children's experiences, influencing their academic performance and strengthening collaboration with teachers. Additionally, the study contributes to the researcher's role as a mathematics teacher in the United States, providing a valuable perspective on SPA's implementation and potentially guiding the development of training programs for effective teaching. Moreover, the study offers valuable baseline data and insights for future researchers interested in exploring the use of SPA in teaching mathematics and science, guiding their subsequent investigations.

### *Scope and Delimitation*

The study is focused on examining the lived experiences of teachers and junior high school students in mathematics teaching and learning through the SPA, considering factors related to curriculum, teacher, student, and school. The research aimed to uncover a comprehensive understanding of SPA by exploring participants' perspectives, enabling and restraining factors, challenges, and coping mechanisms. However, the scope of lived experiences may have been limited, and the study's qualitative nature means that findings are applicable only to the participants involved, potentially not capturing a broader range of experiences since the implementation of SPA. Additionally, the study's results are specific to its locale, and the research was conducted between January and June 2023.

## **LITERATURE REVIEW**

### *Concept and Views about the SPA*

The utilization of the spiral progression approach in education is rooted in Brunner's Spiral Curriculum Model, emphasizing the continuous cognitive development of students by organizing concepts in a manner that builds upon prior knowledge. This model underscores the critical role of teachers in adapting information to suit students' contexts and experiences. Corpuz further expounds on spiral progression as a child-centered approach, enabling mastery through gradual progression from existing knowledge, reinforcing retention, and incorporating activities such as collaborative learning and differentiated instruction. Authentic assessment is employed, departing from traditional methods, as students engage in tasks mirroring real-life scenarios. This approach is likened to a personal educational journey, enabling students to apply and enhance their knowledge progressively (Zulueta, 2002; Martin, 2008).

The benefits of spiral progression encompass reinforcing learning, logical progression from simple to complex concepts, application of acquired knowledge in diverse contexts, and appreciation of content connections across year levels. SPA solidifies comprehension by ensuring consistent revisiting of fundamental ideas, enhancing students' grasp of subjects, and discouraging mere memorization. While SPA offers the promise of mastery, Orale and Uy's study (2018) highlights potential challenges stemming from promotion and retention practices that hinder students' true competence. Conversely, SPA has demonstrated success in enhancing competence, as evidenced by American students who, through repeated exposure and mastery, improved their mathematics proficiency (Gamoran, 2011).

### *Factors Influencing the Lived Experiences of Teachers and Students in the Implementation of SPA*

Alegre and Alegre (2019) focused on teacher-related factors in the implementation of Spiral Progression Approach (SPA) and discovered that effective teacher explanations and active student involvement positively influence SPA's effectiveness. Merza et al. (2018) supported this by showing the impact of teacher factors on SPA, while Ressurecion and Adanza (2015) emphasized the significance of teachers' curriculum knowledge and teaching strategies. Mattick and Knight (2007) asserted SPA's motivational role in activating prior knowledge and interest, especially when topics engage students, aligning with Martin's (2008) emphasis on higher-order thinking skills. However, Flores (2018) noted potential issues arising from uneven pacing of concepts. Rico and Baluyos (2021) highlighted the need for teacher training and interactive strategies to enhance SPA's efficacy. Orale and Uy (2018) cautioned that SPA's success depends on factors like resource access and teacher competencies. Angeles (2013) emphasized students' active engagement, problem-solving, and project-based activities under the K-12 curriculum, fostering better concept comprehension and academic performance. Authentic assessments, reflecting real-world applications and creativity, enhance SPA's effectiveness (Resureccion et al. and Adanza, 2015).

Additionally, Alegre (2019) found that effective teacher presentations motivate students' participation and learning, aligning with the study linking active student engagement to better academic performance (Alegre, 2019). In contrast, some students faced challenges with numerous performance tasks and unfamiliarity with SPA, hampering their participation (Colegio De San Juan De Letran Manila, Montebon, 2019). Overall, SPA's success is tied to teacher competence, student engagement, appropriate pacing, and aligned curricular understanding, highlighting the need for targeted improvements and supportive conditions.

### *Enabling and Restraining Factors in the Implementation of Spiral Progression Approach*

Enabling factors crucial to the effective implementation of the Spiral Progression Approach (SPA) in mathematics teaching encompass teacher effectiveness, subject matter mastery, and the conduct of remedial classes. Competent teachers with deep understanding of concepts enhance students' learning outcomes by contextualizing and experimenting with subjects (Ramos-Samala, 2018; Cabansag, 2014). SPA requires teachers to possess expertise across various mathematical areas, harmonizing competencies and promoting interconnectivity (Dowding, 2013). Specialization, experience, and training influence SPA implementation, as teachers' degrees aligned with teaching loads and intensive training correlate with effective implementation (Quintos et al., 2022). Remedial classes cater to diverse learning paces, allowing students to receive additional support when needed (DepEd Order No. 2003; DepEd Order No. 12 s. 2018).

However, SPA faces restraining factors, including lowered standards resulting from flexible rating systems (Orale & Uy, 2018). Notably, challenges arise due to the



repetition of topics, insufficient mastery of prerequisites, and the domino effect of students not mastering competencies (Snider, 2004; De Dios, 2013; Valin & Janer, 2019). Mass promotion and inadequate cumulative review further inhibit SPA's efficacy (Lapus, 2008; Snider, 2004). Additionally, Amarilla (2019) noted students' lack of mastery as a challenge, with factors such as spacing of topics, mathematics ability, and interest contributing. Positive aspects of SPA include activity emphasis and varied strategies for motivating learning, while desired curriculum changes involve differentiated instruction and increased discussion time (Amarilla, 2019). Teachers' qualifications, resources, and training deficiencies hinder SPA's potential (Orale & Uy, 2018), highlighting the need for comprehensive support to ensure successful SPA implementation and improved learning outcomes.

## METHODOLOGY

### *Research Design*

The research design employed in this study was qualitative, specifically using Edmund Husserl's descriptive phenomenology. This choice was made to delve into and comprehend the core of human experiences regarding the phenomenon under investigation—the implementation of the spiral progression approach in teaching mathematics (Creswell, 2013). The study featured four case studies, serving as illustrative instances that showcased both positive and negative lived experiences of teachers and students using the spiral progression approach. These case studies were instrumental in providing detailed accounts of successful and unsuccessful narratives from teachers and students, offering insights that might not have been captured solely through the broader themes explored in the study.

### *Locale of the Study*

The research was carried out within the Division of Tuguegarao City, focusing on schools such as Cagayan National High School (CNHS), Cataggamman National High School (CatNHS), Gosi National High School (GNHS), Tuguegarao City Science High School (TCSHS), Linao National High School (LNHS), and Tuguegarao City West High School (TCWHS). These selected schools encompass a range of public secondary schools, varying in size and curricular offerings. Notably, newly established integrated schools were excluded from the study's scope.

### *Participants of the Study*

The participants of the study were the public secondary school teachers and their students. The teacher-participants were purposively chosen using the following criteria: They must be/have (a) mathematics majors in their bachelor's degree; (b) been in the service for more than five years; (c) taught mathematics for more than five years; (d) underwent training or seminars in mathematics teaching using the spiral progression approach; (e) holders of Teacher I-III positions; and (f) willing to participate in the study.

On the other hand, the student-participants were chosen based on the following criteria: They must be/have: (a) junior high school students (Grade7-10); (b) high or low performers in mathematics as reflected in their mathematics grade; and (c) willing to participate in the study. A total of 34 teachers and 34 students were the target participants of the study.

### *Research Instruments*

The study employed a semi-structured interview guide that was strategically aligned with the study's objectives. The interview questions were prepared in both English and Filipino languages, tailored to teachers and students respectively, in order to elicit comprehensive and detailed accounts of participants' lived experiences. The instruments underwent a rigorous process involving translation and content validation by three experts. Feedback and suggestions from these experts were incorporated to refine the instrument. Subsequently, the instrument was pilot tested among high school teachers and students from different secondary schools not included in the main study. Feedback from this pilot testing was used to address any discrepancies or concerns, ensuring the final instrument's appropriateness, clarity, and estimated interview duration.

### *Research Procedure*

The researcher secured authorization from the Schools Division Superintendent of Tuguegarao City. Subsequently, permissions were sought from Secondary School Heads to identify suitable teachers and students meeting the study's inclusion criteria. Once permissions were granted, schedules for in-depth interviews or focus group discussions were coordinated according to participants' convenience. A total of 12 focus group discussions and 4 in-depth interviews were conducted.

### *Data Analysis*

In analyzing the qualitative data collected, a coding approach was employed to organize and interpret the textual information. Open coding was utilized to identify and break down concepts and categories present in participants' responses. Axial coding was then employed to extract major themes that connected and differentiated these concepts and categories. Thematic analysis was applied to analyze transcribed data, involving the researcher "thematizing" verbatim responses to derive significant meanings about participants' experiences with the spiral progression approach. This analysis adhered to Braun and Clarke's (2006) steps, encompassing familiarization, coding, theme generation, theme review, theme definition and naming, and final write-up.

Throughout the data analysis process, the researcher engaged in self-reflection, continually assessing the codes and themes. To ensure objectivity, the researcher minimized personal biases and prejudices, treating all participant responses with equal significance. Furthermore, two independent auditors were employed to verify the accuracy of the themes derived from the study, enhancing the credibility of the analysis.

### *Ethical Considerations*



Ethical considerations were central to the qualitative data collection process. Participants were oriented to the study's objectives and encouraged to provide truthful responses, assuring them of data confidentiality and anonymity. Participants signed the Free and Prior Informed Consent Form, adhering to ethical standards. Interview sessions were comprehensive, ensuring that data saturation was achieved. Documentation of data collection was carried out in agreeable and comfortable settings, with participants' permission.

## RESULTS

### Teachers and Students' Perspectives about the SPA

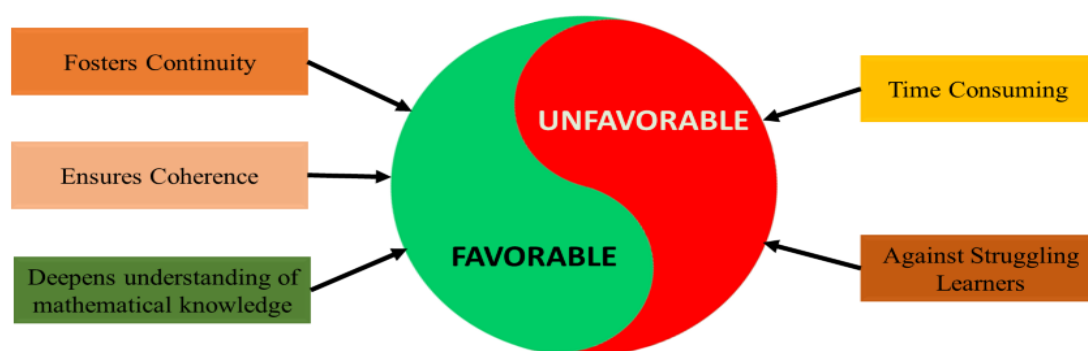


Figure 2. Teachers and Students' Perception of the SPA

Figure 2 shows that the teachers and students perceive the spiral progression approach (SPA) in teaching mathematics to be both favorable and unfavorable. The favorable outlook about SPA stems from its ability to foster continuity, coherence and deeper understanding. Conversely, the unfavorable perspective about SPA is grounded on the fact that it is time consuming and against the struggling learners. This finding is well-articulated in the revelation of the participants in these words:

*I really like teaching math with the spiral way. It helps students learn better because they go back to things they already learned and learn more. This makes their foundation strong and shows how math ideas are connected. Like in trigonometry, they can use what they know about division, multiplication, and algebra. This way, students understand how everything fits together, making learning better for everyone.* - CNHS-Teacher3.

*"I'm a teacher, and I'm worried about teaching math with the spiral way because it takes a lot of time. Even though it has some good points, I think it's a problem that we have to teach things again that students didn't understand well. In this way, students go back to things they learned before, but not all of them remember everything, so I have to spend more time teaching again. This makes it hard to teach everything we need to, and some students feel left behind or not challenged."* - TCSHS-Teacher1

*"I worry about learning math with the spiral method because it seems like the fast learners do well, but I struggle. I feel like I can't catch up, and it makes me frustrated and less confident in my math skills."* - LNHS-Student5

### Teachers and Students' Lived Experiences in the SPA

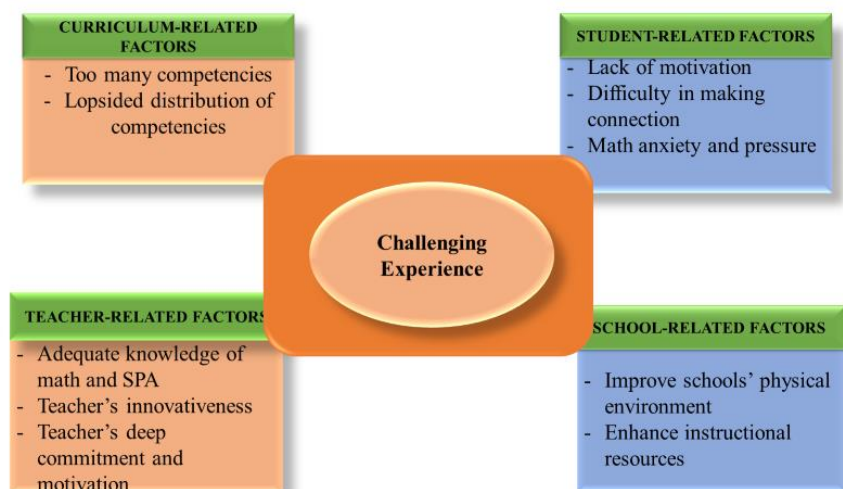


Figure 3. Teachers and Students' Lived Experiences in the SPA

Figure 3 presents that the lived experiences of the teachers and students in the implementation of SPA along the curriculum was challenging. This was brought about by too many competencies to be taught per grade level and the lopsided distribution of competencies per quarter. Notably, the positive or negative lived experiences of teachers and students are reflective of their professional expertise and dedication. Such feeling sprang from the teachers' adequate knowledge of mathematics and in the use of SPA, their innovativeness along strategies and techniques as well as their deep commitment and motivation in teaching. These findings are expressed by the participants in the following thoughts:

*"Teaching math using the spiral approach is really challenging because there's a lot to teach in each grade, from simple math to harder stuff like algebra and geometry. I have to help students learn a lot of things in a short time, which is difficult because I want them to really get it and also cover everything they need to know in a quarter."* – GNHS-Teacher6.

*"Learning math is tough for young students like me. We have to learn a lot quickly, which can make us stressed and worried. Sometimes, we move on to new lessons before fully understanding what we've learned, leading to self-doubt and comparisons with classmates."* – CNHS-Student8

*As a teacher who has received adequate knowledge, expertise, and training in implementing the spiral progression approach, I can confidently say that my experience has been satisfying. I can help my students understand difficult topics by explaining clearly and using real-life examples. This makes our class discussions interesting and helps my students think critically.*” – **TCSH-Teacher1**

Along student-related factors, the lived experience of both the teachers and students was of difficult encounter. Such was attributed to the fact that many students have lack of motivation in learning mathematics, difficulty in making connections between different math topics and apply their knowledge in various contexts, as well as anxiety and pressure to cope with the demands of teaching and learning. With respect to school-related factors, the teachers and students felt the need to improve schools’ physical environment. They felt the need to have more effective instructional resources and improved facilities for teaching and learning. A well-elucidated narration of the participants reflects this finding in these words:

*“As a teacher for 16 years, I’ve had the opportunity to observe and analyze the motivation levels of my students when it comes to learning mathematics. It’s dismaying to say that most of them lack motivation in learning math. This is because they have a general perception that mathematics is a difficult and abstract subject. With such perception, they have feelings of frustration and discouragement, making them reluctant to engage fully with the lessons.*” – **CNHS-Teacher5**

*I really like math but unfortunately, our current resources in TugScie are limited. I wish we could have sufficient tools like graphing calculators and educational software so we could understand math better and learn on our own.*” – **TCSHS-Student5**

#### **Enabling and restraining factors in the implementation of SPA**

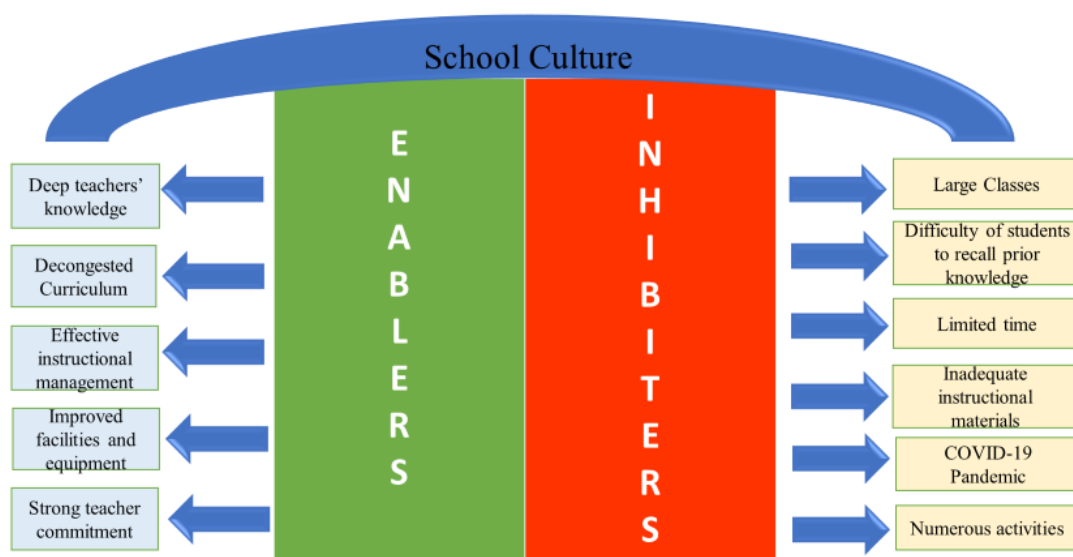


Figure 4. Enabling and restraining factors in the implementation of SPA

The enabling factors in the effective implementation of the SPA in mathematics teaching and learning revolved around providing a supportive school culture. Such supportive school culture was nurtured by the following elements: (a) deep teachers' knowledge and understanding of mathematics and SPA; (b) decongested curriculum; (c) motivated students; (d) effective instructional management of school heads; (e) Improved facilities and equipment; and (f) Strong commitment and dedication of teachers. These factors worked in synergy to create an environment that supports the successful implementation of the SPA and enhanced students' learning outcomes. Such findings were clearly highlighted by the participants in these words:

*"Teachers who know possess a deep understanding of mathematical concepts, connections, and progressions can help students learn better using a spiral approach. Having a deep understanding of math concepts helps them plan and teach lessons that follow the spiral method."* – **CatNHS-Teacher1**

On the other hand, the restraining factors in the implementation of the SPA included: (a) Large Class Sizes; (b) difficulty of students to recall Prior Knowledge; (c) Limited Time to finish numerous competencies; (d) Inadequate instructional Resources; (e) COVID-19 Pandemic; and (f) Multiple activities in the DepEd. Here are some of the thoughts of the participants relative to these factors:

*"Mathematics can be challenging for a lot of students, and it needs a solid understanding of the basics. In math, students often grasp concepts at different rates and might need extra explanations or examples to really get it. But in a crowded classroom with limited time, it's tough to give that needed help to everyone who needs it. This can make some students feel like they're falling behind or finding it hard to catch up, which can affect how well they learn and how motivated they are."* – **CNHS-Teacher1**

*"Personally, I feel frustrated of not having a strong ability in math, which has made it difficult for me to keep up with the spiral progression. Because I lack the understanding from previous topics, it becomes very challenging for me to learn the more advanced concepts. Many times, I feel lost and disconnected from what is discussed in the classroom. It also affected my confidence and made me hesitant to participate in class or ask questions."* – **LNHS-Student5**

*"I am now in Grade 10. Remembering our past lessons in Grade 9 is challenging because I was not able to learn much during the pandemic. The written modules and the online teaching were not effective for me to master all the topics in mathematics. Most of the time, I just copied the answers of our activities which are found at the back of the modules. Because I was only using a cellphone during our online class, I was not able to concentrate listening to the explanations of our teacher. Added to this was my problem of no money to buy the data I needed to attend my online classes."* – **CNHS-Student4**

*"As a teacher, I strongly dislike the many activities we conduct in school because this hinders the delivery of quality instruction. It's disheartening to see how these activities often disrupt our classes and leave us with limited time to cover the essential*

*competencies within a quarter. Unlike the RBEC, mathematics under the K-12 curriculum is very heavy and when we add on additional activities, it becomes increasingly challenging for teachers and students. While some activities may have educational value, their long-term effect is bad because students are no longer taught what they expect to learn within one academic year.” – LNHS-Teacher5*

## DISCUSSION

Both teachers and students hold mixed perceptions of the SPA when it comes to teaching mathematics. The positive outlook on the SPA is congruent with the study of Corpuz (2015) claiming that the SPA provides mastery of concepts as students progress from their own prior knowledge. He also claimed that retention is also being enhanced because they are able to revisit the old concept learned and such is further reinforced with depth and breadth of difficulty. Conversely, the participants' less favorable view of the SPA arises due to its time-intensive nature. Teachers allocating extra time to revisit concepts that students struggle with leads to a slower instructional pace and potential limitations in covering new lessons.

The lived experiences of the teachers and students in the implementation of the SPA within the curriculum were found to be challenging due to several factors. The study highlighted that one of the challenges stemmed from the overwhelming number of competencies to be taught per grade level, which may lead to a rushed coverage of topics and hinder in-depth understanding (Abragan, et al. (2022)). Additionally, the unequal distribution of competencies across quarters further contributed to the difficulties faced by both teachers and students (Trance & Trance, 2019).

Interestingly, the positive or negative experiences reported by teachers reflect their level of professional expertise and dedication. The study indicated that teachers with a solid foundation in mathematics and a deep understanding of SPA were more likely to perceive the approach positively (Dizon, et al., 2019). Their ability to implement innovative strategies and techniques, along with their high commitment and motivation to teaching, played a role in shaping their experiences (Deysolong, 2023). This aligns with the findings of previous research that emphasized the importance of teachers' competence and enthusiasm in influencing the effectiveness of instructional approaches (Jaca,et al., 2018).

In the realm of student-related factors, the lived experiences of teachers and students revealed a challenging encounter, resonating with the observations of several studies. The lack of student motivation in learning mathematics, alongside struggles in connecting and applying knowledge across diverse mathematical contexts, and the burden of coping with academic pressures were significant concerns raised (Smith & Wilhelm, 2002; Deci & Ryan, 2008; Pekrun, 2014). Furthermore, students' feelings of anxiety and pressure were notable factors influencing their experiences in the spiral SPA (Zeidner, 2014).

Relative to school-related factors, both teachers and students expressed a desire for improvements in the physical environment and resources of their educational institutions. Their perceptions align with the findings of previous studies highlighting



the importance of effective instructional resources and enhanced facilities for quality teaching and learning (Renick & Norell, 2012; DeNeve & Heppner, 2017). This insight underscores the critical role that conducive learning environments play in facilitating students' engagement and comprehension of mathematical concepts (Noddings, 2005; Hattie, 2009). The emphasis on the need for improved facilities reflects the growing recognition of how physical surroundings impact students' overall learning experiences and outcomes (Sailer et al., 2015; Marval, 2020).

The successful implementation of the SPA in mathematics teaching and learning was found to be facilitated by a supportive school culture, cultivated through various key elements. Deep teacher knowledge and understanding of mathematics and SPA were identified as essential components (Hill, Ball, & Schilling, 2008; Shulman, 2006). The significance of a decongested curriculum in promoting effective teaching and learning aligns with the research of Tyack and Cuban (2015), emphasizing the importance of a well-structured curriculum that allows for in-depth exploration and understanding. Motivated students were another integral factor contributing to the supportive culture (Wentzel, 2009), fostering engagement and active participation.

Moreover, the role of effective instructional management by school heads was emphasized as a cornerstone of the enabling factors (Hallinger & Murphy, 2015; Leithwood et al., 2014). Improved facilities and equipment further enhanced the learning environment, a finding consistent with studies highlighting the role of infrastructure in promoting quality education (UNESCO, 2018; World Bank, 2015). Lastly, the strong commitment and dedication of teachers played a pivotal role in fostering a supportive school culture (Hargreaves & Fullan, 2012). These enabling factors collectively synergized to create an environment conducive to the successful implementation of the SPA and the improved learning outcomes of students.

The implementation of the SPA in mathematics teaching and learning was hindered by several restraining factors. Large class sizes were identified as a significant challenge (Hanushek & Woessmann, 2012), impacting teachers' ability to provide individualized attention and support to students. The difficulty of students in recalling prior knowledge aligns with research on the importance of knowledge retention and the challenges of bridging gaps in understanding (Bjork & Bjork, 2011).

The limited time to cover numerous competencies resonates with findings by Darling-Hammond et al. (2017), emphasizing the tension between curriculum demands and the need for in-depth learning. Inadequate instructional resources emerged as a major constraint, consistent with the studies highlighting the role of resources in quality education (Filmer & Pritchett, 2019; UNESCO, 2019). The impact of the COVID-19 pandemic on education echoes the global disruptions highlighted by UNESCO (2020), influencing teaching and learning modalities.

Furthermore, the multiple activities within the Department of Education (DepEd) was identified as a hindrance. This aligns with the challenges posed by administrative burdens and policy demands on educators (Fullan, 2013). These restraining factors collectively impeded the seamless execution of the SPA, emphasizing the need for addressing these barriers to achieve successful implementation and enhanced learning outcomes.



## CONCLUSION

The SPA in teaching mathematics elicits mixed perceptions from both teachers and students. While some view it favorably, recognizing its benefits and effectiveness, others have a more negative perception, highlighting its limitations or challenges. The lived experience of both teachers and students in the realm of mathematics education was marked by a challenging encounter, influenced by the curriculum, teacher, student and school-related factors. Notably, the effective implementation of the SPA in mathematics teaching and learning is greatly influenced by the presence of a supportive school culture. This culture is fostered by several key elements that work together to create an environment conducive to successful SPA implementation and improved learning outcomes. In sum, the lived experiences of teachers and students provided rich and insightful data for educators and policymakers to make informed decisions and adaptations to maximize the advantages and minimize the drawbacks of the SPA in mathematics education.

## RECOMMENDATION

In view of the foregoing findings and conclusions, DepEd officials should address class size and resource scarcity issues by reducing student-teacher ratios and seeking funding for instructional resources. They must also streamline activities to support effective SPA implementation and alleviate burdens on teachers and students. Additionally, school and department heads should ensure teachers' deep understanding of mathematics and SPA through professional development, fostering commitment. They, too, need to allocate resources for improved math facilities and equipment to support SPA-related activities. Teachers should also implement differentiated instruction to meet diverse student needs, encourage collaboration among students, and utilize SPA's benefits for concept reinforcement. Finally, future researchers should conduct a similar study in the Schools Division of Cagayan for a broader understanding of SPA implementation experiences.

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