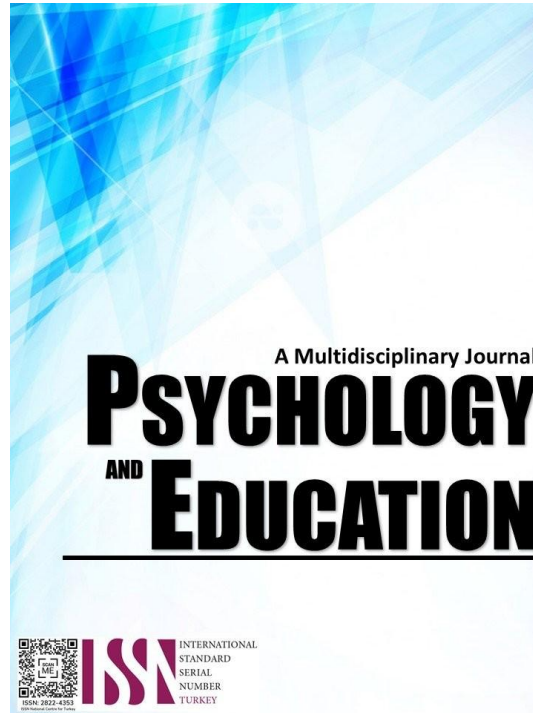


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Teaching Context, Professional Support, and Challenges of Science Teachers in the Spiral Progression Approach

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Abstract

This study explored the relationship among science teachers' teaching context, professional support, and the challenges in implementing the spiral progression approach (SPA). This study utilized a predictive-correlational research design, using a census approach of science teachers among Junior High Schools in the Division of Cagayan de Oro City, Department of Education, during the school year 2025-2026. Data were gathered using a structured, self-administered, researcher-made questionnaire. Findings revealed that science teachers function across diverse teaching contexts, with specializations led by General Science. Science teachers perceived professional training as effective and reported that peer support or mentorship was almost always available. However, they identified the challenges associated with implementing the spiral progression approach as moderately difficult, indicating a steady and clear challenge. Among these, subject matter emerged as the most significant moderate challenge. Analyses using the Pearson correlation coefficient, one-way ANOVA, and multiple regression indicated that the challenges science teachers encountered in implementing the spiral progression approach were not associated with their specific teaching contexts or professional support variables. This concludes that the challenges identified are inherent to the structural framework of the spiral program approach, rather than a byproduct of the teaching context or professional support they received. Recommendations include a curricular review by the Department of Education to design a more effective, evidence-based SPA framework that supports the realities of teaching and learning.

Keywords: *implementation challenges, professional support, science teachers, spiral progression approach, teaching context*

Introduction

The global aim for quality education is enclosed in the United Nations Sustainable Development Goal 4. This mandate underscores a global challenge that has led to many educational reforms seeking inclusive and equitable quality education for all. The K to 12 Curriculum is a worldwide education standard with the intention of molding learners into well-equipped individuals with 21st-century skills, helping them become ready for any challenges after graduation and eventually become globally competitive. This program was formally institutionalized through Republic Act No. 10533, also known as the "Enhanced Basic Education Act of 2013". Science Education aims to develop learners' scientific literacy, enhancing their ability to make judgments and decisions.

A key feature is that the basic concepts of Biology, Chemistry, Earth and Space, and Physics are introduced to the learners starting from Grade 3 and revisited quarterly at every grade level with increasing complexity. Therefore, instead of teaching Biology for a year and then Chemistry for another year, these branches of science are introduced to the learners in the Spiral Progression Approach (Department of Education, 2019). However, achieving this standard remains a challenge.

Educational reforms, both internationally and locally, have encountered various challenges, particularly those that have implemented the spiral or integrated curriculum in science education. Challenges of science teachers included time constraints, administrative issues, and laborious implementation (Haatainen et al., 2021). A local news report showed that Filipino learners continued to be among the weakest in science, comparing the 2022 PISA results to the country's performance in 2018 (Chi, 2023). Furthermore, time constraints, lack of learning materials, lack of cross-disciplinary mastery, and poor retention of basic concepts among learners were some of the challenges encountered (Gico, 2024).

The researcher has been teaching Science 9 in a public school, specifically in the Junior High School, for eight years and has been exposed to the various struggles faced by learners and teachers in science education. It has been observed that many science teachers were products of the old curriculum, wherein teachers were required to choose a specific major in science and focus their studies on that chosen field. However, due to the spiral progression approach introduced by the K to 12 curriculum, teachers were required to teach different branches of science that fell outside their major, which made it challenging for some, considering that science was a complex subject. The researcher has observed that some science teachers teaching their non-majors preferred to let the students watch online video lessons because they had difficulty understanding and explaining the concepts. Some preferred to introduce a specific concept without delving deeper into its understanding and moved on to the next topic, which they thought they were more comfortable teaching.

The current government's response as a reform of the education system, supported by DepEd Order No. 013, series of 2023, and the National Learning Recovery Program, introduced the MATATAG Curriculum, which seeks to address the identified shortcomings, specifically having a congested curriculum and a lack of foundational skills. The new MATATAG Curriculum still follows the spiral progression approach, as it is a refined and enhanced version of the K to 12 curriculum that continues to cover Life Sciences, Chemistry,

Earth Science, and Physics. The curriculum aims to decongest learning content, focus on foundational skills, and ensure a balanced cognitive load for learners. The MATATAG curriculum has started its implementation with Grade 7 in SY 2024-2025 and has recently started with Grade 8 in SY 2025-2026, continuing to roll out gradually to other grade levels until Grade 10 by SY 2027-2028 (Department of Education, 2023).

Few studies have examined the challenges science teachers face with the spiral progression approach. Without addressing these issues, progress toward Sustainable Development Goal 4 is limited.

Therefore, this study explored the relationship among science teachers' teaching context, professional support, and the challenges in implementing the spiral progression approach (SPA), specifically in the public junior high schools, providing essential data to target educational reforms that support quality education.

Research Questions

This study aimed to explore the relationship among science teachers' teaching context, professional support, and the challenges in implementing the spiral progression approach (SPA). Specifically, this study sought to answer the following questions:

1. What are the science teachers' current teaching context in terms of:
 - 1.1 specialization;
 - 1.2 curriculum taught;
 - 1.3 grade level(s) taught; and
 - 1.4 number of preparations?
2. What is the level of professional support received by science teachers in implementing the spiral progression approach in terms of:
 - 2.1 effectiveness of the training; and
 - 2.2 availability of peer support/mentor?
3. What is the level of specific challenges encountered by science teachers in implementing the spiral progression approach in terms of:
 - 3.1 subject matter;
 - 3.2 teaching strategies;
 - 3.3 assessment design; and
 - 3.4 access to resources?
4. Is there a significant relationship between the challenges in implementing the spiral progression approach and
 - 4.1 teaching context; and
 - 4.2 professional support?
5. Which among the variables, singly or in combination, significantly predicts the challenges in implementing the spiral progression approach?

Methodology

Research Design

This study utilized a predictive-correlational approach. Predictive research investigates the ways in which certain independent variables influence the prediction of a dependent variable, employing methods such as regression analysis to assess the strength and importance of these associations (Bagnol, 2025). This study also explored the correlation between variables. Correlational is a non-experimental quantitative design in which the correlational statistics are applied to measure and describe the degree of association among variables (Asenahabi, 2019). Correlational research aims to understand the association between two variables in a larger sample of people, rather than merely examining individual scores (Walters, 2020). In this study, the researcher aimed to understand how the independent variables, including the current teaching context and professional development and support, were related to the dependent variables, specifically, the perceived challenges in implementing the spiral progression approach. As a result, these variables were not altered; rather, they were observed and measured. Overall, the predictive-correlational research design was closely aligned with the aims of this study.

Respondents

The participants of this study comprised all currently employed science teachers in the Junior High Schools located in Districts A, B, and C of Cagayan de Oro City's Department of Education. Specifically, this study sought teachers who were professionally trained and qualified to instruct in science subjects, actively teaching science through the spiral progression method, and possessing a minimum of one year of teaching experience, in order to explore their teaching context, professional support, and the challenges they encountered in implementing the Spiral Progression Approach. Moreover, this study utilized the census approach, which studied every individual in a population, also known as a complete enumeration or complete count (Australian Bureau of Statistics, n.d.), and including every single teacher ensured a thorough and accurate representation of the challenges faced by science teachers in implementing the Spiral Progression Approach, while eliminating the selection bias and sampling error. Furthermore, the census approach, or complete

enumeration, was appropriate for the study being investigated because the total population of science teachers across the three districts was small, manageable, and fully accessible to the researcher. As supported by a study, this approach was advantageous for its accuracy in recruiting a pure population as compared with sampling methods (Yoshino et al., 2021).

Instrument

The data were gathered through a structured, self-administered, researcher-made questionnaire. This questionnaire was carefully designed to gather quantitative data on the teachers' teaching context, professional support, and challenges in implementing the spiral progression approach (SPA), which may be correlated. The questionnaire was divided into different sections consisting of variables aligned with the study's objectives.

Part 1 gathered data on the teachers' teaching context, specifically gathering data on specialization, the curriculum taught, grade level(s) taught, and the number of preparations.

Part 2 gathered data on professional support, including the teachers' perceived effectiveness of the training and the availability of peer support/mentor. The teachers rated each of these using a 5-point Likert scale (e.g., from "Strongly Disagree" to "Strongly Agree").

Part 3 measured the dependent variables, such as the teachers' challenges in implementing the spiral progression approach. This assessed the teachers' challenges using a 5-point Likert scale (e.g., from "Not Difficult at all" to "Extremely Difficult"); these were detailed, providing insights into the exact challenges that science teachers encountered, specifically in terms of subject matter, teaching strategies, assessment design, and access to resources.

Procedure

This study involved a single-point data collection through a structured, self-administered, researcher-made questionnaire to collect quantitative data on the science teachers' teaching context, professional support, and challenges in implementing the spiral progression approach (SPA). Prior to the commencement of the study, the researcher sought approval from the dean of the School of Teacher Education of the University to conduct the study and completed the Research Ethics Form to ensure that the study upheld values such as mutual respect and fairness. The researcher requested permission from the Schools Division Superintendent to conduct the study in the Junior High Schools within the specified districts. Upon approval, the researcher sent letters to the school principals or school heads to seek their cooperation in gathering data from the target population in a manner that adhered to educational protocols and ethical standards.

After securing all necessary permissions and conducting validity and reliability tests on the questionnaire, data collection proceeded. The researcher worked together with the respective school principals or school heads to identify the most efficient strategy for distributing and collecting the questionnaires, or designated a contact person to facilitate distribution and collection. To avoid disruption of classes, data collection was scheduled during the teacher's free time. The designated contact person was briefed on maintaining confidentiality and respecting teachers' voluntary participation. The data collection involved every science teacher in the Junior High Schools of Districts A, B, and C. These were teachers who were professionally trained and qualified to teach science subjects. Consequently, the study excluded teachers from Senior High School (Grades 11-12), those located outside the specified districts, and those teachers who were non-science majors but were assigned to teach science subjects. Those with less than a year of teaching experience may have arisen from different foundational issues and were not directly related to the implementation of the spiral progression approach (SPA). It took about 25-30 minutes to answer the questionnaire, but teachers were welcome to take rest breaks as needed.

Transparency was ensured by providing a comprehensive written informed consent form before participation, which indicated explicit agreement. The consent form provided details on the purpose, intervention, selection, voluntary participation, procedures, duration, risks, benefits, reimbursements, confidentiality, sharing of results, and the right to refuse or withdraw, as well as the contact information of the researcher and the ethics committee.

Participation in this study was entirely voluntary, and teachers could withdraw at any time for any reason without penalty. Since their participation in this study was entirely voluntary, they would not receive any payments for expenses incurred as a result of their involvement. Moreover, the results of this study would provide essential data to target educational reforms that support quality education. No further benefits have been made to encourage participation. Since this study involved the educational community, the researcher ensured that the results were presented constructively, emphasizing improvements rather than individual deficiencies.

There were no known risks to participation beyond those encountered in everyday life. This study was funded solely by the researcher and had no known conflicts of interest with any individuals or institutions that may influence the study's outcome. To ensure their privacy, any information collected from teachers during the survey was kept anonymous and confidential. To ensure anonymity, no identifying personal details were recorded on the questionnaire.

Finally, all collected data were stored with utmost security and then systematically encoded into the appropriate statistical software. All digital data was secured on a password-protected device. Any hard copies of consent forms and questionnaires were stored in a secure cabinet, accessible only by the researcher. Both would be retained for a minimum of five years after the completion of the study,



after which the identifiable data would be securely destroyed, while de-identified data may be kept indefinitely for academic use. To identify and address any inconsistencies and missing values, the data underwent a cleaning process to ensure its accuracy for further statistical analysis.

Data Analysis

The data collected through the self-administered, researcher-made questionnaire were encoded. They underwent a thorough analysis using both descriptive and inferential statistics, as well as appropriate statistical software, namely the Statistical Package for the Social Sciences (SPSS) software. Before that, the data cleaning process was conducted to identify and address any missing values or inconsistencies.

For the descriptive analysis, this study thoroughly quantified and summarized the characteristics of teachers, encompassing all independent and dependent variables. For problem 1, categorical variables were calculated through frequency counts and percentages to describe the teachers' teaching context (Australian Bureau of Statistics, n.d). For problem 2, the mean and standard deviation were used to describe the central tendencies and variability of the teachers' professional support using the 5-point Likert scale responses (Science Education Resource Center at Carleton College, 2025). For problem 3, the mean and standard deviation were calculated using the 5-point Likert scale responses, which were used to quantify the challenges of the science teachers and illustrate the spread of responses across difficulty levels (Science Education Resource Center at Carleton College, 2025). For Problem 4, the Pearson Correlation Coefficient and One-Way ANOVA were employed to determine the significant relationships between the challenges encountered by the science teachers in implementing the spiral progression approach and their teaching context and professional support. The One-Way ANOVA was specifically used to compare categorical groups (Fein et al., 2022). Moreover, for parametric tests, it was assumed that the data were very close to a normal distribution or were normally distributed (Stewart, 2025). For problem 5, multiple regression was used to determine which variables, singly or in combination, significantly predicted the challenges in implementing the spiral progression approach (Sun et al., 2023).

Ethical Considerations

This study adhered to established ethical standards in educational research to ensure the protection of participants and the integrity of the research process. Prior to data collection, ethical clearance was obtained from the university, and formal permissions were secured from the Schools Division Superintendent and participating school heads. All participants were provided with a comprehensive informed consent form outlining the purpose, procedures, duration, voluntary nature of participation, and their rights, including the right to refuse or withdraw at any time without penalty. Participation involved minimal risk, limited to the time required to complete the questionnaire, and no incentives were provided to avoid undue influence. Transparency was maintained by clearly communicating the objectives and intended use of the findings, ensuring that results would be reported in a constructive and non-evaluative manner.

Confidentiality and data privacy were strictly upheld throughout the study. No personally identifiable information was collected, and responses were anonymized to protect participants' identities. Data were securely stored in password-protected digital files and locked physical storage, accessible only to the researcher, and will be retained for a specified period before secure disposal. The study declared no conflict of interest and was conducted independently to ensure objectivity. Data handling procedures, including cleaning and analysis, were performed with accuracy and integrity, and findings were reported honestly without fabrication or selective omission. Overall, the study upheld principles of respect, beneficence, and justice, ensuring that participants were treated fairly and that their contributions were used responsibly for academic and educational improvement purposes.

Results and Discussion

This section presents, analyzes, and interprets the data obtained from the science teachers. The presentation of results is organized based on the research problems.

What are the science teachers' current teaching context in terms of Specialization, Curriculum Taught, Grade Level(s) Taught, and Number of Preparations?

Table 1. *Participants' Teaching Context*

Teaching Context		Frequency	Percent
Specialization	Biology	22	30.1
	Chemistry	13	17.8
	Earth Science	0	0
	Physics	6	8.2
	General Science	28	38.4
	Other Science Field	4	5.5
Total		73	100.0
Curriculum Taught	K to 12	29	39.7
	Matatag	32	43.8
	Others	12	16.4
	Total	73	100.0



Grade Level Taught	Grade 7	14	19.2
	Grade 8	16	21.9
	Grade 9	14	19.2
	Grade 10	11	15.1
	Others	18	24.5
	Total	73	100
Number of Preparations	1.00	31	42.5
	2.00	33	45.2
	3.00	6	8.2
	4.00	3	4.1
	Total	73	100.0

Table 1 presents the frequency and percentage distribution of the science teachers’ current teaching context in terms of specialization, curriculum taught, grade level taught, and number of teaching preparations (N = 73). Overall, the results suggest the science teachers’ variability in teaching assignments across these contextual dimensions, indicating that they function across diverse teaching contexts, distinguished by various specializations, curricula, grade-level assignments, and those with one or more teaching preparations. In terms of specialization, General Science teachers constituted the largest proportion of the teachers (38.4%, n = 28), and none in Earth Science, indicating an uneven distribution of specializations, with greater representation in General Science. Regarding the curriculum taught, most science teachers reported teaching the MATATAG Curriculum (43.8%, n = 32), while teaching both curricula (16.4%, n = 12) accounted for the minority. In terms of the grade level distribution, the Grade 8 science teachers had the highest proportion (21.9%, n = 16), while Grade 10 had the lowest representation (15.1%, n = 11). This indicates a relatively balanced allocation of teaching loads across grade levels. Finally, in teaching preparations, the majority of teachers reported handling two preparations (45.2%, n = 33) and only a small proportion managed four (4.1%, n = 3) preparations, indicating that most science teachers carry a moderate teaching load.

These findings highlight that the dominance of science teachers with a General Science specialization, with the MATATAG curriculum and the previous K to 12 curriculum both in play, necessitates professional support to meet the demands of the subject area and the curricular transitions. Moreover, the proportional distribution of grade levels and teaching loads may provide a supportive, conducive environment to implement the curricula effectively and improve the quality of education in science.

What is the level of professional support received by science teachers in implementing the spiral progression approach in terms of the effectiveness of the Training, and the availability of Peer Support/ Mentor?

Table 2. Participants’ Level of Professional Support in terms of the Effectiveness of the Training

Indicators	Mean	SD	Description	Interpretation
1. The training improved my knowledge and understanding of the foundational principles of the spiral progression approach.	4.42	.685	Agree	Effective
2. The training has equipped me to address the varied learning needs of my learners when using the spiral method.	4.39	.681	Agree	Effective
3. The training has given me practical teaching strategies for teaching complex science concepts using the spiral method.	4.35	.694	Agree	Effective
4. The training equipped me with the skills in designing science lessons using the spiraling method.	4.34	.711	Agree	Effective
5. The training taught me how to effectively use assessment methods to evaluate learning based on the spiral progression approach.	4.32	.708	Agree	Effective
6. The training enabled me to select appropriate instructional materials to support learning in line with the spiral progression approach.	4.34	.749	Agree	Effective
7. The training is timely and relevant to the challenges and needs I experience in teaching the different branches of science.	4.31	.743	Agree	Effective
8. The training has prepared me to deliver the necessary knowledge and skills to learners across different branches of science effectively.	4.34	.730	Agree	Effective
Overall Mean	4.35	.650	Agree	Effective

Legend: 5 (4.51–5.00) – Strongly Agree – Highly Effective; 4 (3.51–4.50) – Agree – Effective; 3 (2.51–3.50) – Moderately Agree – Moderately Effective; 2 (1.51–2.50) – Disagree – Ineffective; 1 (1.00–1.50) – Strongly Disagree – Highly Ineffective.

Table 2 presents the mean scores and standard deviations describing the science teachers’ level of professional support received in implementing the spiral progression approach in terms of the effectiveness of training. The overall mean of 4.35 with a standard deviation of 0.65 falls within the Agree category and is interpreted as Effective. The results indicate that science teachers generally perceived that the training they received was effective in enhancing their instructional competencies. The relatively low composite standard deviation suggests that science teachers’ perceptions regarding the effectiveness of the training were similar. In the context of public schools, the shift to a spiral progression approach initially posed a significant challenge, particularly for teachers who had taught a single branch of science for decades. However, in the early years of its implementation, there were trainings introduced to the science teachers that would help them become more equipped, especially when handling those subjects that fall outside their specializations. Over time, the number of training sessions provided to science teachers declined, which disadvantaged early-career teachers, especially those trained in a specific discipline. These teachers received fewer opportunities for professional growth, which made it more difficult



for them to implement the spiral progression method.

Among the indicators, Indicator 1 obtained the highest mean score ($M = 4.42$, $SD = 0.69$), indicating that teachers perceived that their knowledge and understanding of the foundational principles of the spiral progression approach improved because of the training. On the other hand, the lowest mean score was observed for Indicator 7 ($M = 4.31$, $SD = 0.74$); however, this value still falls within the effective range, indicating positive perceptions regarding the fact that the training was timely and relevant to the challenges and needs the teachers experience in teaching the different branches of science. The lowest mean in this study may suggest the ongoing difficulty teachers face in mastering complex topics in teaching across different branches of science, especially for those that fall outside their specialization.

This concludes that the efficacy of the training, viewed as Effective, shows that teachers regularly regarded the professional training as advantageous for enhancing their instructional methods concerning the spiral progression approach. This aligns well with Bustamante's (2025) study, which demonstrated significant evidence of the professional development programs in their effectiveness for the science teachers, indicating a positive perception across various aspects. This is further supported by the study of Meesuk (2021), as reflected in the highest mean score in the data, which emphasized that educators across various educational levels unanimously recognized the importance of professional development within Professional Learning Communities (PLCs) because these were crucial to ongoing teacher learning. The data showing a low standard deviation aligns with the study by Ancho and Arrieta (2021), which showed that Filipino teachers possessed a thirst for knowledge and sought to unlearn and relearn skills and concepts to meet their students' needs now and in the future in this evolving educational landscape.

Nevertheless, the results reveal a subtle divergence when weighed against prior research regarding preparation and readiness by Daguio and Bernardo (2019), which indicated that teachers encountered moderately serious challenges regarding their preparedness, which had a direct impact on their ability to execute the Science Program due to inadequate K to 12 training provided by the Department of Education. However, teachers were actively seeking solutions and interventions to ensure the effective implementation of the program and have taken the initiative to improve their teaching skills by utilizing web-based resources and readings. Moreover, this aligns with the study by Garcia (2021), as reflected in the lowest mean score in the data, which pointed out that consolidating specialized subjects into a single level was considered a challenge. This suggests that while the training evaluated in the table was perceived as effective, it may be an exception to a broader systemic lack of preparation.

Table 3. *Participants' Level of Professional Support in terms of the Availability of Peer Support/ Mentor*

Indicators	Mean	SD	Description	Interpretation
1. I can easily receive support from my supervisors and mentors who are knowledgeable in the spiral progression approach and across all branches of science when needed.	4.00	.781	Agree	Almost Always Available
2. I know where to find a peer or mentor to ask for assistance when I face challenges in my lessons.	4.21	.692	Agree	Almost Always Available
3. I receive timely feedback and assistance from my supervisors or mentors to improve my teaching in science.	3.94	.724	Agree	Almost Always Available
4. I find that the whole science department supports me through its positive and collaborative environment.	4.21	.749	Agree	Almost Always Available
5. There are opportunities for focus group discussions and learning action cells for professional development.	4.32	.667	Agree	Almost Always Available
6. I find myself to be more confident in teaching science because I have a consistent support group from peers and mentors.	4.27	.672	Agree	Almost Always Available
Overall Mean	4.16	.582	Agree	Almost Always Available

Legend: 5 (4.51–5.00) – Strongly Agree – Always Available; 4 (3.51–4.50) – Agree – Almost Always Available; 3 (2.51–3.50) – Moderately Agree – Available; 2 (1.51–2.50) – Disagree – Rarely Available; 1 (1.00–1.50) – Strongly Disagree – Not Available.

Table 3 presents the mean scores and standard deviations describing the science teachers' level of professional support received in implementing the spiral progression approach in terms of the availability of peer support or a mentor. The overall mean of 4.16 with a standard deviation of 0.58 falls within the Agree category and is interpreted as Almost Always Available, indicating that science teachers generally perceived peer and mentor support as almost always available in assisting them with the implementation of the spiral progression approach. The relatively low composite standard deviation suggests consistency in teachers' perceptions regarding the availability and usefulness of peer and mentor support.

In practice, learning action cells are implemented in schools because these sessions must be conducted every school year. These sessions provide opportunities to discuss instructional updates, challenges encountered, and best practices to share among colleagues. Although peer support was almost always available, asking peers for assistance can be difficult due to time constraints. This practice is much easier for smaller schools than for larger ones because time-schedule differences and classrooms located far apart would make it more difficult. While the master teachers are also teachers, their function is supervisory and administrative. They conduct instructional coaching, provide technical assistance and feedback, monitor teacher performance, and facilitate the learning action cells. Because they are also teachers with teaching loads, timely feedback and assistance from them wouldn't be possible due to time constraints and competing workload demands. Vertical support is typically limited to master teachers and rarely extends to school administrators in



larger schools. However, in small schools, some don't have master teachers, and their school administrators serve as supervisors.

Among the indicators, Indicator 5 obtained the highest mean score ($M = 4.32$, $SD = 0.67$), suggesting that teachers strongly agreed that there were opportunities for focus group discussions and learning action cells for professional development. The lowest mean score was observed for Indicator 3 ($M = 3.94$, $SD = 0.72$). However, it falls within the almost always available range; the slightly lower mean score suggests comparatively less agreement among teachers regarding the timeliness of feedback and assistance from supervisors or mentors. This concludes that the availability of peer support and mentoring was perceived as a vital and consistently present component of professional support in implementing the spiral progression approach. The findings align with the studies of Molise (2024) and Khasawneh et al. (2023). Their studies emphasized the essentials in enhancing the teachers' pedagogical practices and subject knowledge. These were support systems and professional learning communities, thereby helping in alleviating anxiety as well as strengthening job satisfaction (Molise, 2024), while simultaneously fostering collaboration among educators, which significantly benefits both teachers' professional development and student performance (Khasawneh et al., 2023). Additionally, the data are supported by the studies of Manzano (2022) and Gonzales (2019) on the crucial need for "support mechanisms" among science teachers to overcome the challenges they encountered in teaching science. Furthermore, this is supported by Dagasaan (2022), who showed that teachers reported having access to professional development opportunities and that continuous professional development was essential for overcoming challenges. This mirrors the highly rated value of focus group discussions and learning action cells for professional development, as reflected in the highest mean score in the data.

In contrast, the study by Khasawneh et al. (2023) reported that time constraints hindered effective collaboration among teachers, which also mirrored the lowest mean score in the data. The findings indicate that while science teachers in the study viewed peer support as almost always available, time limitations and other administrative responsibilities may hinder prompt feedback from supervisors or mentors.

Table 4. Summary of the Level of Professional Support Received by the Participants

Sub-constructs	Mean	SD	Description	Interpretation
Effectiveness of the Training	4.35	.650	Agree	Effective
Availability of Peer Support/ Mentor	4.16	.582	Agree	Almost Always Available
Overall Mean	4.26	.523	Agree	Effective/ Almost Always Available

Legend: 5 (4.51–5.00) – Strongly Agree – Highly Effective/ Always Available; 4 (3.51–4.50) – Agree – Effective/ Almost Always Available ; 3 (2.51–3.50) – Moderately Agree – Moderately Effective/ Available; 2 (1.51–2.50) – Disagree – Ineffective/ Rarely Available ; 1 (1.00–1.50) – Strongly Disagree – Highly Ineffective/ Not Available.

Table 4 presents a summary of the mean scores and standard deviations for the level of professional support received by science teachers in implementing the spiral progression approach. The overall mean of 4.26 with a standard deviation of 0.52 falls within the Agree category and is interpreted as Effective with regard to the effectiveness of the training and Almost Always Available for the availability of peer support or mentor, suggesting that science teachers experience a high level of professional support through both formal training and collaborative support mechanisms. Among the sub-constructs, the effectiveness of the training had the highest mean score ($M = 4.35$, $SD = 0.65$), suggesting that teachers strongly agreed that professional development activities and training programs effectively enhanced their capacity to implement the spiral progression approach. The availability of peer support or mentor also yielded a high mean score ($M = 4.16$, $SD = 0.58$), indicating that teachers generally perceived peer and mentor support as almost always available, though slightly lower compared to training effectiveness.

This concludes that both sub-constructs suggest consistency in teachers' perceptions regarding professional support, that effective training enhances the pedagogical foundation, while overcoming challenges and ensuring its effective application through collaborative support. This conforms to the study by Bustamante (2025), who revealed high manifestations of the professional development programs in their effectiveness. Likewise, the findings of Molise (2024) and Khasawneh et al. (2023) emphasized the essentials in enhancing the teachers' pedagogical practices and subject knowledge, and these were support systems and professional learning communities. Moreover, supported by the study of Ancho and Arrieta (2021), as reflected in the highest mean score for the training, which pointed out that Filipino teachers possessed a thirst for knowledge and sought to unlearn and relearn skills and concepts to meet their students' needs. Conversely, the findings of Dagasaan (2022), Manzano (2022), and Gonzales (2019), who revealed the vital role of support mechanisms in overcoming the challenges teachers face, align with the reported availability of peer support or a mentor. However, this sub-construct obtained a slightly lower mean in the data; it still reflects a high level of support.

What is the level of specific challenges encountered by science teachers in implementing the spiral progression approach in terms of Subject Matter, Teaching Strategies, Assessment Design, and Access to Resources?

Table 5 presents the mean scores and standard deviations describing the level of specific challenges encountered by science teachers in implementing the spiral progression approach in terms of subject matter. The overall mean of 2.91 with a standard deviation of 1.02 falls within the Moderately Difficult category and is interpreted as a Steady and clear challenge. This suggests that the science teachers generally experience a moderate level of difficulty related to subject-matter demands when implementing the spiral progression approach. Moreover, this also suggests moderate variability in teachers' responses across the indicators.

In the school environment, this refers to science teachers becoming the "jack-of-all-trades," in which, regardless of their specializations, they are required to teach all branches of science under the K to 12 curriculum. However, for those who specialize in biology, teaching



chemistry and physics proved challenging. Those who struggled to teach these concepts often rely on online resources such as YouTube lessons. On the other hand, teachers who specialize in chemistry and physics experience fewer difficulties in teaching across branches.

Table 5. Participants' Level of Specific Challenges encountered in terms of Subject Matter

Indicators	Mean	SD	Description	Interpretation
1. I find teaching other branches of science, especially concepts beyond my specialization, difficult	2.90	1.05	Moderately Difficult	Steady and clear challenge
2. I find connecting previously learned concepts with new and more advanced concepts difficult because they are not prerequisites.	2.80	1.18	Moderately Difficult	Steady and clear challenge
3. I find it difficult to find sufficient time to cover all the required science subject matter adequately.	3.10	1.14	Moderately Difficult	Steady and clear challenge
4. I find it time-consuming and difficult to reteach the concepts before we can teach the actual lesson because learners tend to forget their previous lessons.	3.31	1.21	Moderately Difficult	Steady and clear challenge
5. I find transitioning from one branch of science to another within the same school year difficult.	2.71	1.25	Moderately Difficult	Steady and clear challenge
6. I find it difficult to teach science concepts using the spiraling method as learners progress through each grade.	2.61	1.24	Moderately Difficult	Steady and clear challenge
7. I find teaching science concepts difficult because some of the topics are not arranged in a logical progression.	2.84	1.19	Moderately Difficult	Steady and clear challenge
8. I find scaffolding learners with diverse learning needs and abilities difficult due to the subject matter's complexity.	2.97	1.15	Moderately Difficult	Steady and clear challenge
Overall Mean	2.91	1.02	Moderately Difficult	Steady and clear challenge

Legend: 5 (4.51–5.00) – Extremely Difficult – Overwhelming or Severe Challenge; 4 (3.51–4.50) – Very Difficult – Major Challenge; 3 (2.51–3.50) – Moderately Difficult – Steady and Clear Challenge; 2 (1.51–2.50) – Slightly Difficult – Minor Challenge; 1 (1.00–1.50) – Not Difficult at All – No Significant Challenge.

Indicator 4 obtained the highest mean score (M = 3.31, SD = 1.21), which suggests that teachers moderately agreed that reteaching learned concepts before the actual lesson was time-consuming, as learners tend to forget their previous lessons. While the lowest mean was observed for Indicator 6 (M = 2.61, SD = 1.24), suggesting that teachers agreed with the lesser difficulty of teaching science concepts using the spiraling method as learners progress through each grade. However, this remains within the Moderately Difficult interpretation range.

This concludes that the science teachers continue to encounter significant subject-matter-related challenges, despite being able to implement the spiral progression approach, which could then affect the pacing, coherence, and depth of their instruction. This is similar to what Esguerra and Natividad (2025) and Samala (2018) found in their studies on the challenges science teachers face when teaching outside their areas of expertise. Esguerra and Natividad (2025) observed that this often led to lessons being discussed only briefly and made it harder for teachers to cover content in depth. In addition, Baron and Dela Cruz (2023) reported that lesson continuity across all grade levels often failed to provide a solid connection between concepts, with topics covered in previous years irrelevant in the current year. This is further supported by the findings of Samala (2018), who reported that teachers found it difficult to track both vertical and horizontal articulation of learning competencies, as students often forgot previous lessons, as evidenced by the highest mean score in the data. Similarly, as observed by Degorio (2022), some content was not arranged in a logical order, which made it difficult for learners to connect previous lessons to the new ones. Additionally, teaching specific disciplines became difficult due to the illogical sequencing of content, in which knowledge from previous lessons did not consistently serve as prerequisites for subsequent lessons.

Conversely, the study by Calzado and Abo (2025) stated more positive findings. Vertical articulation was rated very high, indicating an effective continuity and integration of previously covered material across grade levels, as reflected in the lowest mean score in the data. This also indicated the relevance of earlier topics in current lessons, supporting the spiral progression methodology aligned with the K to 12 curriculum.

Table 6 presents the mean scores and standard deviations describing the level of specific challenges encountered by science teachers in implementing the spiral progression approach in terms of teaching strategies. The overall mean of 2.66 with a standard deviation of 0.92 falls within the Moderately Difficult category and is interpreted as a Steady and clear challenge. This indicates that teachers experience a moderate level of difficulty with regard to designing and applying effective teaching strategies. The standard deviation suggests some variability in teachers' experiences across the different indicators.

In practice, the science teachers are very resourceful yet feel overburdened by the weight of the pedagogical expectations. The pressure often leads science teachers to choose between best practice and a practical, feasible one. In a school environment where instructional pacing is a primary challenge, meaningful teaching and learning often suffer and are at an increased risk. The high student-to-teacher ratio in each classroom sometimes makes it impossible to conduct differentiated instruction. Teachers are often stretched too thin to accommodate every learner's unique strength and weakness. Moreover, in reality, tailoring teaching strategies to accommodate the diverse needs and interests of the learners is difficult because of insufficient resources and limited instructional time. Despite these challenges, the science teachers are inherently creative and resourceful, often using their own funds or utilizing household items to



make teaching and learning more meaningful and engaging, as well as to bridge the gap between the pedagogical demands and the daily realities of the classroom.

Table 6. Participants' Level of Specific Challenges encountered in terms of Teaching Strategies

Indicators	Mean	SD	Description	Interpretation
1. I find it difficult to design and implement teaching strategies due to the complexity of the concepts.	2.65	1.10	Moderately Difficult	Steady and clear challenge
2. I find differentiating instructions to accommodate the diverse needs of the learners difficult.	2.75	1.07	Moderately Difficult	Steady and clear challenge
3. I find it difficult to use teaching strategies to sustain active engagement and motivation throughout a lesson.	2.54	1.06	Moderately Difficult	Steady and clear challenge
4. I find the use of teaching strategies that develop the critical thinking and problem-solving skills of the learners difficult.	2.68	1.03	Moderately Difficult	Steady and clear challenge
5. I find applying teaching strategies that connect previously learned concepts to the new ones difficult.	2.46	1.00	Slightly Difficult	Minor challenge
6. I find the use of teaching strategies difficult due to the limited instructional time.	3.09	1.04	Moderately Difficult	Steady and clear challenge
7. I find it difficult to develop teaching strategies that reinforce essential ideas without being repetitive for the learners.	2.84	1.04	Moderately Difficult	Steady and clear challenge
8. I find applying real-world examples to my teaching strategies difficult.	2.26	1.05	Slightly Difficult	Minor challenge
Overall Mean	2.66	.921	Moderately Difficult	Steady and clear challenge

Legend: 5 (4.51–5.00) – Extremely Difficult – Overwhelming or Severe Challenge; 4 (3.51–4.50) – Very Difficult – Major Challenge; 3 (2.51–3.50) – Moderately Difficult – Steady and Clear Challenge; 2 (1.51–2.50) – Slightly Difficult – Minor Challenge; 1 (1.00–1.50) – Not Difficult at All – No Significant Challenge.

Indicator 6 obtained the highest mean score (M = 3.09, SD = 1.04), indicating that teachers moderately agreed that limited instructional time posed a significant challenge to teaching strategies. Indicator 8 (M = 2.26, SD = 1.05), as the lowest mean, is within the Slightly Difficult range, suggesting minor challenges in incorporating real-world examples into teaching strategies.

This concludes that the science teachers are capable of implementing various teaching strategies; however, they still encounter moderate challenges, particularly in developing strategies, instructional time, and tailoring these strategies to accommodate the diverse needs of the learners, which could affect the effectiveness of the spiral progression approach. This conforms to the studies by Gico (2024) and Paraiso et al. (2025), which pointed out the challenges regarding content mastery and teaching strategies. Gico (2024) reported that time constraints were a major challenge, as reflected by the highest mean score in the data. Moreover, Paraiso et al. (2025) noted the challenges in identifying and selecting teaching strategies that address the varying levels of students' understanding and learning styles as reported by out-of-field junior high school science teachers. Furthermore, a study by Walag et al. (2020) showed that although science teachers reported high confidence in identifying various teaching strategies for teaching science effectively, they still encountered difficulties.

In contrast, the findings of Baltazar (2025) reported that the teachers' successful integration of various teaching and learning processes, particularly the exploration of integrative and interactive strategies, was observed. Likewise, Maing et al. (2019) found that 76% of teachers preferred relating the subject matter to real-life situations, as reflected in the lowest mean score in the data.

Table 7. Participants' Level of Specific Challenges encountered in terms of Assessment Design

Indicators	Mean	SD	Description	Interpretation
1. I find using assessment strategies that accurately measure and track the progress of the learners difficult.	2.39	1.12	Slightly Difficult	Minor challenge
2. I find designing assessment methods appropriate for the learners' diverse needs difficult.	2.50	1.06	Slightly Difficult	Minor challenge
3. I find developing assessment methods that allow me to connect previously learned concepts to the new ones difficult.	2.42	.998	Slightly Difficult	Minor challenge
4. I find designing rubrics and performance guides that accurately evaluate the complex skills in science difficult.	2.38	1.07	Slightly Difficult	Minor challenge
5. I find it difficult to create assessments that effectively connect concepts across all branches of science, including biology, chemistry, earth and space, and physics.	2.49	1.15	Slightly Difficult	Minor challenge
6. I find developing assessments that measure the learners' critical thinking and problem-solving skills difficult.	2.71	1.04	Moderately Difficult	Steady and clear challenge
7. I find giving learners enough time on tasks difficult due to the limited amount of time allotted in each competency.	2.97	1.18	Moderately Difficult	Steady and clear challenge
8. I find developing assessments that address learners' misconceptions, given their varied prior knowledge, difficult.	2.58	1.09	Moderately Difficult	Steady and clear challenge
Overall Mean	2.55	.973	Moderately Difficult	Steady and clear challenge

Legend: 5 (4.51–5.00) – Extremely Difficult – Overwhelming or Severe Challenge; 4 (3.51–4.50) – Very Difficult – Major Challenge; 3 (2.51–3.50) – Moderately Difficult – Steady and Clear Challenge; 2 (1.51–2.50) – Slightly Difficult – Minor Challenge; 1 (1.00–1.50) – Not Difficult at All – No Significant Challenge.



Table 7 presents the mean scores and standard deviations describing the level of specific challenges encountered by science teachers in implementing the spiral progression approach in terms of assessment design. The overall mean of 2.55 with a standard deviation of 0.97 falls within the Moderately Difficult category and is interpreted as a Steady and clear challenge. This indicates that science teachers generally experience a moderate level of difficulty with regard to designing and implementing effective assessments. The standard deviation suggests moderate variability in teachers’ responses across the indicators.

In practice, using assessment methods that account for learners’ diverse needs is a complex task that teachers are obliged to undertake. This is not because of the teachers’ lack of willingness, but because of the significant challenges due to insufficient instructional time and limited time allotted for each competency. When a teacher is constrained by a rigid timeline, a thorough, individualized evaluation is difficult and often at risk. Although some of these challenges are minor, others are considered moderate. This suggests that structural support from school administrators is needed to facilitate instructional flexibility and curricular depth to make the assessment methods assess and address learners’ needs effectively for meaningful learning.

Indicator 7 obtained the highest mean score (M = 2.97, SD = 1.18), indicating moderate difficulty in providing learners with enough time to complete tasks due to the limited time allotted for each competency. Indicator 4 (M = 2.38, SD = 1.07) obtained the lowest mean, indicating minor challenges in designing rubrics and performance guides that accurately evaluate the complex skills in science.

This concludes that while teachers face moderate challenges in certain aspects of assessment design—particularly related to time management, critical thinking evaluation, and addressing misconceptions—most other aspects of assessment implementation are perceived as less challenging. This conforms to the study by Agawin and Alferez (2024), which revealed that teachers demonstrated strong skills in assessment planning. This suggested the importance of developing strong planning strategies among teachers.

However, a study by Tesorio and Canizares (2018) found that teachers recognized that assessment served to diagnose students' abilities and reflected the effectiveness of their instructional strategies and methods. Teachers had the autonomy to choose assessment methods, but this responsibility could create added pressure because their effectiveness is being evaluated by these procedures. This perspective likely explains the moderate difficulty, as the responsibility lies in choosing the right assessment methods.

Moreover, the findings align significantly with the study of Penuel et al. (2025), which emphasized that teachers needed tools that do not demand considerable time from them to implement, like straightforward prompts in assessments that encourage students to draw connections between the phenomena in tasks and a related phenomenon that interests them, as reflected in the highest mean score in the data.

Conversely, the findings by Giray and Kim (2023) noted that teachers provided students with checklists and rubrics to assist them in understanding and fulfilling the expectations associated with their assigned tasks and assignments, as reflected in the lowest mean score in the data. However, a study by Mangali et al. (2019) suggested that these areas were problematic from the learners’ perspectives. Students found the use of these assessments to be challenging as they struggled to understand the purpose of these assessments, the grading criteria for the outputs, and the workload involved in completing tasks, not only in science but across all their subjects.

Table 8. *Participants’ Level of Specific Challenges encountered in terms of Access to Resources*

Indicators	Mean	SD	Description	Interpretation
1. I find teaching science concepts difficult due to the limited availability of relevant textbooks and modules.	2.73	1.28	Moderately Difficult	Steady and clear challenge
2. I find teaching science concepts difficult due to insufficient materials and facilities.	3.01	1.25	Moderately Difficult	Steady and clear challenge
3. I find access to digital and online resources for learning difficult due to limited or no internet connectivity in every classroom.	2.79	1.30	Moderately Difficult	Steady and clear challenge
4. I find it difficult to acquire comprehensive teacher's manual guides to help implement the spiral method.	2.65	1.18	Moderately Difficult	Steady and clear challenge
5. I find acquiring professional training that emphasizes the practical implementation of the spiral progression approach difficult.	2.78	1.16	Moderately Difficult	Steady and clear challenge
6. I find teaching science concepts difficult due to the limited availability of hands-on teaching aids, such as models, real-world objects, and contextual examples.	2.83	1.17	Moderately Difficult	Steady and clear challenge
7. I find access to laboratory technician support difficult due to limited or no personnel availability.	3.06	1.30	Moderately Difficult	Steady and clear challenge
8. I find acquiring differentiated learning resources to accommodate the varying levels of learner comprehension difficult.	3.02	1.20	Moderately Difficult	Steady and clear challenge
Overall Mean	2.86	.972	Moderately Difficult	Steady and clear challenge

Legend: 5 (4.51–5.00) – Extremely Difficult – Overwhelming or Severe Challenge; 4 (3.51–4.50) – Very Difficult – Major Challenge; 3 (2.51–3.50) – Moderately Difficult – Steady and Clear Challenge; 2 (1.51–2.50) – Slightly Difficult – Minor Challenge; 1 (1.00–1.50) – Not Difficult at All – No Significant Challenge.

Table 8 presents the mean scores and standard deviations describing the level of specific challenges encountered by science teachers in implementing the spiral progression approach in terms of access to resources. The overall mean of 2.86 with a standard deviation of 0.97 falls within the Moderately Difficult category and is interpreted as a Steady and clear challenge, indicating that teachers generally experience moderate challenges with regard to the availability and accessibility of instructional resources. The standard deviation



suggests some variability in teachers’ perceptions across the indicators.

In practice, although teachers recognize the value of hands-on experiences, these were not attainable due to limited materials and facilities. Science teachers use indigenous or localized materials to make the learning experiences of the learners more meaningful. Regarding textbooks, not all students receive each one, and some learners prefer to leave those at home to avoid the physical strain of carrying heavy books daily.

Indicator 7 had the highest mean score ($M = 3.06$, $SD = 1.30$), indicating moderate difficulty with access to laboratory technician support due to limited or no personnel availability. On the other hand, Indicator 4 obtained the lowest mean in acquiring comprehensive teacher's manual guides to help implement the spiral method.

This concludes that access to both physical and digital instructional resources proved to be a moderate challenge for teachers in implementing the spiral progression approach in science education effectively, aligning significantly with the study by Usman-Kaibat et al. (2024), who revealed various challenges encountered by teachers, and one of those was the limited educational resources, which referred to the limited availability of teaching and learning materials. Moreover, this was supported by De Vera et al. (2020), who emphasized that the availability of materials in schools was an ongoing concern and that there was a mismatch between the number of enrolled students and the number of available equipment and facilities. Teachers frequently decide against implementing activities, which impedes students' growth in essential skills because of insufficient resources for science projects and laboratory tools.

Additionally, this trend is especially noticeable in the data's highest mean score, underscoring a shortage of laboratory technicians. This is similar to what Torres (2023) revealed, that the standard equipment and supplies, and the science laboratories equipped for experiments, were barely available in schools. Additionally, Garcia (2021) also emphasized that laboratory experiences played a pivotal role in science teaching. Numerous advantages have been reported from involving students in laboratory work, and a lack of these could hinder students' advancement.

Conversely, a study by Giray and Kim (2023) noted that the teachers referred to the learner's module for lessons and activities, as reflected in the lowest mean score in the data. This suggests that the frequent use of these materials makes them the most accessible resource, which explains why teachers perceive them as the least difficult.

Table 9. Summary of the Level of Specific Challenges Encountered by the Participants

Sub-constructs	Mean	SD	Description	Interpretation
Subject Matter	2.91	1.02	Moderately Difficult	Steady and clear challenge
Teaching Strategies	2.66	.921	Moderately Difficult	Steady and clear challenge
Assessment Design	2.55	.973	Moderately Difficult	Steady and clear challenge
Access to Resources	2.86	.972	Moderately Difficult	Steady and clear challenge
Overall Mean	2.75	.861	Moderately Difficult	Steady and clear challenge

Legend: 5 (4.51–5.00) – Extremely Difficult – Overwhelming or Severe Challenge; 4 (3.51–4.50) – Very Difficult – Major Challenge; 3 (2.51–3.50) – Moderately Difficult – Steady and Clear Challenge; 2 (1.51–2.50) – Slightly Difficult – Minor Challenge; 1 (1.00–1.50) – Not Difficult at All – No Significant Challenge.

Table 9 shows the summary of the mean scores and standard deviations grouped by sub-construct to get a clearer picture of the specific challenges encountered by science teachers in implementing the spiral progression approach. The overall average of 2.75, with a standard deviation of 0.86, fits into the Moderately Difficult category and is understood as a steady and clear challenge. This suggests that teachers typically face moderate difficulties concerning the application of the spiral progression method. The relatively low overall standard deviation suggests moderate consistency in teachers’ responses across the sub-constructs.

Among the specific challenges, the science teachers identified Subject Matter ($M = 2.91$, $SD = 1.02$) with the highest mean score, as their most significant challenge, suggesting that teachers perceived the high-rated moderate challenges in handling content knowledge, connecting concepts, and managing instructional time. While Assessment Design ($M = 2.55$, $SD = 0.97$) obtained the lowest mean score, it had fewer challenges, although it falls into the moderate difficulty category. Specifically, these challenges exist in certain aspects, such as time management, developing assessments that measure the learners' critical thinking and problem-solving skills, and addressing learners’ misconceptions.

This concludes that while science teachers can implement the spiral progression approach, they still encounter moderate challenges across all sub-constructs. The findings are consistent with what Gico (2024) revealed- that despite the spiral progression approach being highly implemented, science teachers still encountered various challenges. This is further supported by De Vera et al. (2020), who also reported that the curriculum was congested with overlapping and disconnected concepts, which made it difficult for both teachers and students to retain the information.

Additionally, Usman-Kaibat et al. (2024) showed that the implementation of the spiral curriculum was poorly planned because there were congested topics, specifically, too many subjects squeezed into a short period of time. This explains the steady and clear challenges encountered by the science teachers based on the study’s findings, suggesting that despite being able to implement the spiral progression approach, the science teachers continue to face challenges.

Moreover, Esguerra and Natividad (2025) and Samala (2018) found in their research on the challenges science teachers face when teaching outside their areas of expertise, as reflected in the highest mean score in the data. Esguerra and Natividad (2025) observed

that this often led to lessons being discussed only briefly and made it harder for teachers to cover content in depth. Likewise, Samala (2018) reported the difficulty of teachers in tracking both vertical and horizontal articulation of learning competencies because students often forgot previous lessons. In addition, Baron and Dela Cruz (2023) reported that lesson continuity across all grade levels often failed to provide a solid connection between concepts, with topics covered in previous years irrelevant in the current year.

On the other hand, a study by Agawin and Alferes (2024) revealed that teachers demonstrated strong skills in assessment planning, as reflected in the lowest mean score in the data. However, a study by Tesorio and Canizares (2018) found that teachers recognized that assessment served to diagnose students' abilities and reflected the effectiveness of their instructional strategies and methods.

Is there a significant relationship between the challenges in implementing the spiral progression approach and Teaching Context, and Professional Support?

Table 10. *Pearson Correlation of Challenges in Implementing the Spiral Progression Approach with Teaching Context and Professional Support (N = 73)*

Variable	Pearson r	p-value	Effect Size	Interpretation
Grade Level Taught	-0.122	0.303	Small	Not Significant
Number of Preparations	0.068	0.566	Small	Not Significant
Effectiveness of Training	-0.184	0.118	Small	Not Significant
Availability of Peer Support/Mentor	-0.092	0.438	Small	Not Significant
Overall Professional Support	-0.166	0.161	Small	Not Significant

Note. N = 73. All correlations are Pearson r. None of the correlations is statistically significant ($p > 0.05$). Effect size interpretation based on Cohen (1988): small ($r \approx 0.10$), medium ($r \approx 0.30$), large ($r \approx 0.50$).

Table 10 presents the results of the Pearson correlation analysis examining the relationship between the level of challenges in implementing the spiral progression approach, teaching context (grade level taught and number of preparations), and professional support (effectiveness of training and availability of peer support/mentor, and overall professional support) among science teachers (N = 73). All correlations yielded p-values exceeding the 0.05 threshold, indicating that none of the correlations reached statistical significance.

In the teaching context, the relationship between challenges and grade level taught was negative and weak ($r = -0.122$, $p = 0.303$), indicating a small effect size and a minimal tendency for teachers at higher grade levels to report fewer challenges. On the other hand, there was a positive and very weak ($r = 0.068$, $p = 0.566$) correlation between the challenges and the number of preparations, showing a small effect size below the 0.10 threshold. This suggests that the number of preparations does not meaningfully contribute to the level of challenges encountered. In professional support, all correlations were negative, showing an inverse relationship with challenges. Effectiveness of the training ($r = -0.184$, $p = 0.118$) shows a small effect size, indicating a slight but non-significant tendency for higher training effectiveness to be associated with fewer challenges. Nonetheless, the Availability of peer support/mentor ($r = -0.092$, $p = 0.438$) reflects a very weak effect, showing a small effect size below the 0.10 threshold. Overall professional support ($r = -0.166$, $p = 0.161$) also shows a small effect size, suggesting a slight but non-significant tendency for greater professional support to be associated with fewer challenges. Moreover, given the small effect size, additional professional support in real-world settings may not be sufficient to address the challenges science teachers encounter.

According to the findings, the null hypothesis, which asserts that there is no significant relationship between the challenges in implementing the spiral progression approach and the science teachers' teaching context and professional support, is not rejected.

The lack of significance in these variables represents an important finding. The data suggest that the challenges science teachers encountered in implementing the spiral progression approach extend beyond grade level, the number of preparations, the effectiveness of the training, the availability of peer support/mentor, and the overall professional support. This indicates that the challenges are inherent to the structural framework of the spiral program approach, rather than a byproduct of the science teachers' teaching context and professional support variables. Whether a teacher teaches Grade 7 or Grade 10, or handles one or more preparations, the difficulty remains constant. For professional support, whether the teacher rates the training as effective, and peer support as almost always available, the difficulty remains constant. The training programs may not be able to target the specific difficulties science teachers face in the daily realities of the classroom. Consequently, a teacher may feel supported by peers and mentors, yet limited by conflicting schedules, administrative tasks, and the physical distance between classrooms in larger schools.

The finding that grade level had no significance aligns significantly with Gico (2024), who revealed that the spiral progression approach was "highly implemented," and this did not show a significant difference concerning the teachers' classification in terms of highest educational attainment, grade level taught, field of specialization, or length of teaching experience. However, the science teachers continued to report challenges in insufficient learning materials, time constraints, difficulty in mastering different areas of specialization, and poor retention of basic concepts among learners.

However, the data are inconsistent with the findings of Solomo (2021), who reported that the nature of the challenge varies by science discipline across grade levels. For instance, Grade 7 science teachers reported that their strongest competencies were in Biology, but scored lowest in Physics. Those in Grades 8 and 10 excelled in Earth Science and performed least effectively in Chemistry. A major finding was that the complexity of scientific concepts increased from one grade to the next, requiring deeper comprehension of core



ideas and higher competencies in Grade 9. Additionally, Torres (2023) reported that the science teachers in Grade 7 prioritized the various forms required by the Department of Education (DepEd), which made it difficult for them to conduct classes and meet the intended competencies. This situation posed a risk to the spiral progression approach in teaching science, since lessons in subsequent grade levels build on those in previous ones, implying that these teachers carried greater systemic weight than those in more advanced grade levels.

Regarding the result of the number of preparations, this is consistent with the study by Barrios et al. (2023), who revealed that there was no significant relationship found between workload and teaching efficiency, which indicated that even when high school teachers experienced heavy workloads, they were still able to maintain a very satisfactory level of teaching efficiency. Likewise, as observed by Tarraya (2023), overwhelming workloads could lead to the teachers' decline in their efficiency and effectiveness in the classroom. However, in its findings, some studies have shown that teachers still received satisfactory performance ratings. This suggests that teaching effectiveness is not reliant merely on the number of tasks assigned.

The result that professional support implies a limited practical impact aligns with the study by Magtulis and Brunio (2025), who revealed that teachers pointed out several major concerns, and one of those was a lack of institutional support. The high mean score, along with inadequate school-based support, indicated that schools may not be delivering enough targeted assistance for teachers dealing with subjects beyond their expertise. This also explains why the data show a weak correlation between the professional support available and the challenges encountered by science teachers. Teachers may receive professional support, but it is not targeted to the specific challenges that they face. Similarly, a study by Anto et al. (2023) also found that a lack of administrative support was one of the challenges faced by the science teachers. One of them expressed feeling isolated and lacking support as a new educator. This supports the weak correlation in the data because the support is inconsistent. The mere presence of the mentor is insufficient to mitigate the challenges encountered.

Likewise, a study by Arellano and Jusayan (2019) pointed out that after the training, science teachers believed the training had enhanced their inherent abilities. As a result, their perception improved to average, with a slight increase in the mean scores across all areas. However, it was advised that the Department of Education provide a follow-up intensive training program that focuses on both subject content and teaching methods, delivered over an extended period, particularly for teachers who are not specialists in the field. This indicates that standard training is insufficient to reduce the challenges encountered by science teachers.

On the other hand, Dagasaan (2022) reported that despite the challenges encountered, teachers had a positive perception of the curriculum and believed that through continuous professional development and having a strong support system, they could overcome them. This contrasts with the data, which indicates that professional support has little impact on the challenges. Furthermore, Manzano (2022) highlighted the use of "support mechanisms," namely peer tutoring/mentoring, team teaching, and self-initiative, who also emphasized that although science teachers encountered difficulties when teaching outside their areas of expertise, they actively employed these strategies to ensure effective delivery of science instruction. These findings contrast with the results, which indicate that the presence of support mechanisms does not significantly affect the challenges encountered by science teachers.

Table 11. *One-Way ANOVA for Challenges in Implementing the Spiral Progression Approach by Participants' Specialization and Curriculum Taught (N = 73)*

<i>Variable</i>	<i>F</i>	<i>p</i>	<i>Interpretation</i>
Teachers' Specialization	.552	0.698	Not Significant
Curriculum Taught	1.44	0.243	Not Significant

Note. N = 73. Interpretation based on $p < 0.05$.

Table 11 presents the results of the One-Way ANOVA examining the relationship between challenges in implementing the spiral progression approach and science teachers' specialization, as well as the curriculum taught (N = 73). The results indicate that there is no statistically significant relationships in the level of challenges based on teachers' specialization ($F = .552, p = 0.698, \eta^2 \approx 0.02$) and curriculum taught ($F = 1.44, p = 0.243, \eta^2 \approx 0.01$), suggesting that the level of challenges encountered by science teachers does not vary meaningfully across different specializations or types of curriculum. Given the effect sizes for both comparisons are small ($\eta^2 < 0.06$), indicating that the science teachers' specialization and curriculum taught have minimal practical impact on the challenges experienced.

Based on the findings related to specialization and the curriculum being taught, these further reinforce the acceptance of the null hypothesis, which posits that there is no significant relationship between the challenges in implementing the spiral progression approach and the science teachers' teaching context and professional support. The absence of significance in this context, along with prior analyses regarding grade level and the number of preparations, affirms that there is no noteworthy correlation between these teaching contextual variables and the challenges in executing the spiral progression approach. The lack of significant relationships provides an important insight. The data suggest that, regardless of their area of specialization, science teachers consistently encounter challenges in implementing the spiral progression approach. Regarding the curriculum, the MATATAG curriculum is still new and has been introduced only at the Grades 7 and 8 levels, so its advantages and challenges are not yet widespread. Although most of the science teachers surveyed used the MATATAG curriculum, the data indicate that moderate difficulty persists. Despite these difficulties, teachers continue to develop strategies to mitigate the challenges.



The lack of statistical significance between the science teachers' specialization and the challenges they encountered align with the study by Walag et al. (2020), who revealed that the high school science teachers had all satisfactory levels of Personal Science Teaching Efficacy (PSTE) and Science Teaching Expectancy Outcome (STEO), which also highlighted that they shared confidence in teaching biology, followed by earth science, chemistry, and physics. Physics was shown as their least confident subject to teach. This explains why the study's results show that specialization has minimal impact: regardless of their specialization, science teachers face similar levels of difficulty in teaching across scientific disciplines.

However, the data are inconsistent with Malahay (2021), who showed that a teacher's specialization was a determining factor in teaching performance, with the general science major receiving an outstanding rating, the scientific field a very good rating, and the non-science field a good rating. This implied that those with a major in general science were the most qualified to teach science because they had the necessary educational background.

Additionally, De Vera et al. (2020) discovered a notable issue regarding the mismatch in specialization, as the spiral progression method in science did not correspond with the teachers' areas of expertise. This method proved beneficial for teachers specializing in General Science. However, the data indicate that specialization does not significantly influence the extent of challenges faced by science teachers.

Regarding the curriculum taught, the data showing no statistically significant difference aligns with the Department of Education (2023)'s MATATAG curriculum. This curriculum is a recalibration of the previous one; however, in science, it still follows a spiral progression. Since this is a revision of the old curriculum, it is supposed to reduce the number of competencies to provide teachers with more instructional time. Since the pedagogical method, the spiral progression approach, remains the same across the old and new curricula, science teachers continue to face a consistent set of challenges. However, the data is in contrast to the findings of Quijano (2021), who showed that teachers strongly contradicted that there were mismatched teacher qualifications, a lack of knowledge, skills, proper attitudes and values toward the curriculum, insufficient knowledge of teaching strategies, and poor awareness of the purposes, goals, and objectives of the curriculum. Thus, the implementation of the curriculum was not considered a big issue in their department. Teachers taught subjects within their fields of specialization. Since most of them were seasoned teachers, they believed they possessed knowledge, skills, and attitudes, as well as expertise in teaching strategies. However, the data show that, whether teachers were matched or not, the challenges remain the same.

Which among the variables, singly or in combination, significantly predicts the challenges in implementing the spiral progression approach?

Table 12. Multiple Regression Predicting Challenges in Implementing the Spiral Progression Approach (N = 73)

Predictor	B	Std. Error	Beta	t	p	Tolerance	VIF	Interpretation
Constant	4.408	0.928	—	4.750	0.000	—	—	Not Significant
Specialization	-0.008	0.057	-0.017	-0.136	0.892	0.862	1.16	Not Significant
Curriculum Taught	-0.298	0.154	-0.248	-1.937	0.057	0.800	1.24	Not Significant
Grade Level	-0.072	0.042	-0.232	-1.704	0.093	0.705	1.41	Not Significant
Number of Preparations	0.289	0.150	0.263	1.923	0.059	0.704	1.42	Not Significant
Availability of Peer Support/Mentor	0.460	0.324	0.311	1.417	0.161	0.273	3.66	Not Significant
Overall Professional Support	-0.663	0.360	-0.403	-1.842	0.070	0.274	3.64	Not Significant

Model Summary: R = 0.366, R² = 0.134, Adjusted R² = 0.056, F (6, 66) = 1.706, p = 0.133
 Note. Not all predictors are statistically significant (p > 0.05). VIF < 5 indicates no multicollinearity.

Table 12 presents the multiple regression analysis conducted to determine whether teachers' specialization, curriculum taught, grade level, number of preparations, availability of peer support/mentor, and overall professional support significantly predict the challenges in implementing the spiral progression approach (N = 73). The overall model was not statistically significant, F (6, 66) = 1.706, p = 0.133, and explained a small proportion of the variance in challenges (R² = 0.134, Adjusted R² = 0.056), indicating that only 13.4 % of the variability in challenges could be accounted for by the predictors.

None of the predictors individually reached statistical significance. Teachers' specialization (B = -0.008, p = 0.892), curriculum taught (B = -0.298, p = 0.057), grade level (B = -0.072, p = 0.093), number of preparations (B = 0.289, p = 0.059), availability of peer support/mentor (B = 0.460, p = 0.161), and overall professional support (B = -0.663, p = 0.070) were all not significant predictors. Ultimately, the results suggest that none of the measured teaching context and professional support variables reliably influence the level of challenges encountered in implementing the spiral progression approach.

According to the findings, the null hypothesis, which asserts that there is no variable, singly or in combination, significantly predicting the challenges in implementing the spiral progression approach, is not rejected.

The fact that none of these variables emerged as significant predictors represents a substantial finding. The lack of significance of specialization suggests that the levels of difficulty in teaching across different scientific disciplines are a shared reality among science teachers. While the curriculum taught and the number of preparations showed no significance, this indicates that these factors have minimal practical impact on the challenges. In much the same way, grade level, peer support, and overall professional support did not appear to reduce or predict the challenges faced by teachers meaningfully. However, negative Beta values indicate a non-significant

trend toward fewer challenges with higher levels of support.

The lack of statistical significance in the science teachers' specialization and the challenges they encountered align with the study by Walag et al. (2020), who revealed that the high school science teachers reported shared confidence in teaching biology, followed by earth science, chemistry, and physics. Physics was shown as their least confident subject to teach. This explains why the study's results show that, regardless of their specializations, the science teachers face similar levels of difficulty in teaching across scientific disciplines.

In the curriculum taught, having data showing no statistically significant difference aligns with the MATATAG curriculum. This curriculum is a recalibration of the previous one; however, in science, it still follows a spiral progression. Since the pedagogical method, specifically the spiral progression approach, has not changed between the old and new curricula, science teachers persist in encountering the same set of challenges. Moreover, the results align significantly with Gico (2024), who revealed that the spiral progression approach was "highly implemented," and showed no significant difference concerning the teachers' classification in terms of grade level taught and field of specialization. However, the science teachers continued to report challenges in insufficient learning materials, time constraints, difficulty in mastering different areas of specialization, and poor retention of basic concepts among learners.

Regarding the number of preparations, this is consistent with the study by Barrios et al. (2023), who revealed that there was no significant relationship found between workload and teaching efficiency, which indicated that even when high school teachers experienced heavy workloads, they were still able to maintain a very satisfactory level of teaching efficiency.

Furthermore, the result that professional support implies a limited practical impact aligns with the study by Magtulis and Brunio (2025), who revealed that teachers pointed out several major concerns, and one of those was a lack of institutional support. The high mean score, along with inadequate school-based support, indicated that schools may not be delivering enough targeted assistance for teachers dealing with subjects beyond their expertise. This also explains why the data show a weak correlation between professional support and the challenges science teachers face. Teachers may receive professional support, but it often does not target the specific challenges that they encounter.

This concludes that the challenges encountered by science teachers in implementing the spiral progression approach are unrelated to their teaching context or the professional support they have received, as presented in this study. The root of the challenges likely lies in unmeasured factors, such as classroom resources, student readiness, or individual teaching experience.

Conclusions

This study concludes that the challenges encountered by science teachers in implementing the Spiral Progression Approach (SPA) are largely inherent in its structural design rather than significantly influenced by variations in teaching context or the level of professional support provided. Although teachers are able to implement the approach, they consistently experience moderate challenges across all sub-constructs, with subject matter emerging as the most pronounced difficulty. This suggests that the breadth and integration of multiple science disciplines within the SPA impose substantial cognitive demands on teachers.

From the perspective of Cognitive Load Theory, these findings indicate that teachers may be experiencing high intrinsic cognitive load due to the complexity and scope of the curriculum. The requirement to teach diverse and conceptually demanding topics across biology, chemistry, physics, and earth science may exceed manageable cognitive processing limits, thereby affecting instructional delivery. This reinforces the view that the challenges are embedded within the curriculum structure itself, rather than being solely attributable to teacher capability or contextual factors.

Furthermore, while professional support was generally perceived as almost always available and effective, it demonstrated limited influence in mitigating the identified challenges. Drawing on Self-Efficacy Theory, the findings suggest that general forms of support, such as verbal encouragement or broad training, may not sufficiently strengthen teachers' confidence in handling complex, discipline-specific content. This lack of a significant relationship between professional support and experienced challenges implies a mismatch between the type of support provided and the actual instructional demands faced by teachers.

The results also align with the Concerns-Based Adoption Model, indicating that teachers may remain at a sustained "stage of concern" in relation to the SPA. The persistence of challenges regardless of context or support suggests that the innovation itself requires refinement. Specifically, the spiral structure may need to be recalibrated to better align with teachers' expertise, available instructional time, and the cognitive readiness of learners. Additionally, the presence of unmeasured factors—such as classroom resources, student preparedness, and individual teaching experience—points to the need for a more comprehensive understanding of implementation conditions.

In light of these findings, it is recommended that the Department of Education undertake a systematic review of the SPA framework to address content complexity and improve alignment with classroom realities. Curriculum developers should consider designing more accessible and scaffolded instructional materials, particularly for non-specialist teachers. School administrators are encouraged to provide targeted, subject-specific professional development and strengthen collaborative structures such as Learning Action Cells to address discipline-based challenges. Teachers, in turn, should engage in collaborative planning and knowledge-sharing practices, while

learners should be supported in developing self-directed learning strategies to enhance continuity of understanding across grade levels. Finally, future research should extend this study by incorporating additional variables such as classroom resources, student readiness, and individual teaching experience to better explain the persistence of implementation challenges. Qualitative approaches, including phenomenological studies, may provide deeper insights into teachers' lived experiences with the SPA. Such investigations will contribute to more context-responsive reforms and support the development of a more effective and sustainable science curriculum.

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