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THE TEACHING OF SCIENCE USING SPIRAL PROGRESSION APPROACH: BASIS FOR DIGITIZED INSTRUCTIONAL MATERIALS

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Abstract : This study focused on the Spiral Progression Approach in teaching of Science in Bugalllon I and II Districts, Schools Division Office I Pangasinan during the School Year 2024-2025. It focused on the profile of the Science teachers in terms of highest educational attainment, present position, number of years of experience in teaching of Science, and relevant in-service training attended; the extent of implementation of the Spiral Progression Approach the K to 12 Basic Education Curriculum; the advantages and disadvantages of Spiral Progression Approach; the common teaching strategies used in teaching Spiral Progression Approach. The researcher found out that generally, most of the Science teachers are educationally qualified in terms of educational attainment, present position, number of years of experience, relevant in-service training attended and specialization. Spiral Progression Approach is moderately implemented by the Science teachers. Public school teachers perceive that sometimes spiral progression in science has advantages and disadvantages. Significant statistically, discovery / inquiry learning, collaborative learning and experiential learning are the most commonly used and most effective teaching strategies of public school teachers under the context of spiral progression program. The proposed intervention strategies will help the teachers implement the Spiral Progression Approach in teaching Science. The researcher recommended that teachers should be encouraged to finish their graduate studies by providing scholarships to teachers who are interested to continue their studies to uplift their professional qualification. Send teacher to training/seminars related to the implementation of the Spiral Progression Approach to improve their competence and skills. More seminars/training should be given free to teachers to address the needs identified in the implementation of Spiral Progression Approach.

Keywords: Spiral Progression Approach, digitized instructional materials

INTRODUCTION

From the plethora of evidence found in the extensive science education literature, it is undeniable that science education is currently grappling with a multitude of challenges that urgently require attention. The ultimate aim of preparing students to effectively navigate our modern era of science and technology risks becoming a mere fantasy if these pressing issues are not promptly addressed. Without a concerted effort to tackle the persistent barriers hindering reform, there is a real risk that our citizens will lack the necessary scientific literacy essential for thriving in today's scientific and technological landscape.

One commendable reform initiative lies in the enhancement of science teaching and learning quality within educational institutions. This endeavor should be a top priority for policymakers and all relevant stakeholders in the field of science education. It is crucial to empirically investigate the underlying issues within the realm of science education. Securing the support of key stakeholders in delving into and uncovering the realities of science instruction and learning within our schools is essential. Through this process, a clear and realistic depiction of the current state of science education can be formulated, paving the way for actionable recommendations to bridge the gap between the existing situation and the desired ideal.

For instance, by conducting in-depth studies on the effectiveness of different teaching methodologies and their impact on student engagement and comprehension, educators can gain valuable insights into improving science education delivery. Moreover, fostering collaboration between schools, universities, and industry partners can enrich students' learning experiences by providing real-world applications of scientific concepts.

Before the implementation of the K to 12 Curriculum, the Philippines stood out as the only country in Asia, and among the three remaining countries globally, with a 10-year basic education program. This unique educational system was at odds with the calls from international universities and professions, which advocated for a 12-year education program. The implications of the shorter schooling years in the Philippines were profound, resulting in younger graduates who often fell below the legal age of 18 to enter the workforce, potentially lacking the emotional preparedness required for higher education, employment, and entrepreneurship.

The need for educational reform in the Philippines was evident not only for the individual development of each Filipino but also for the broader social and economic progress of the country. The Philippine Education for All (EFA) goals underscored the importance of providing a more robust and comprehensive education system. As part of the Philippine Education for All Plan of Action 2015, Critical Task No. 5 emphasized the expansion of basic education, aiming to transition to a 12-year schooling cycle by 2015.

President Benigno S. Aquino recognized the urgency of enhancing the education system, advocating for the addition of two years to basic education. He highlighted the disparity between those who could afford longer schooling periods and the opportunities it afforded their children compared to public school students. Dr. Yolanda S. Quijano, a DepEd Undersecretary, further emphasized the significance of the proposed K to 12 curricular reform during an International Conference Workshop. She noted that this reform would align Philippine education with international standards, paving the way for a more competitive and globally recognized educational system.

Responding to the critical need for educational improvement, the DepEd and its stakeholders embarked on the K to 12 reform, encompassing Kindergarten, six years of elementary, and six years of secondary education. This comprehensive reform aimed to decongest and enhance the education curriculum, allowing learners to master essential competencies. By extending the cycle of basic education to cover kindergarten through year 12, the Philippines sought to provide a more holistic and effective educational experience for its students, better preparing them for future challenges and opportunities.

The K to 12 education program is a transformative initiative aimed at addressing the limitations of the traditional ten-year basic education system. By extending the educational cycle to include Kindergarten, six years of elementary school, four years of junior high school, and two years of senior high school, the program seeks to enhance learning outcomes and elevate the quality of education in the Philippines. This comprehensive approach is expected to yield significant improvements in the academic performance of Filipino students on a global scale.

With the implementation of RA 10533, also known as the Enhanced Basic Education 2013, Filipino pupils are now required to complete a more extensive educational journey that aligns with international standards. This shift signifies a departure from the outdated 10-year basic education cycle, positioning the Philippines alongside countries like Angola and Djibouti in prioritizing a more robust educational framework. President Aquino's recognition of the deficiencies in the previous system underscores the urgent need for educational reform to equip young people with the necessary skills for future endeavors.

The Department of Education (DepEd) emphasizes the importance of preparing students to be competitive and employable upon graduation at the age of 18. By incorporating languages that resonate with learners and engaging teachers as key stakeholders in curriculum development, the program aims to bridge the gap between local education and global benchmarks. Teachers play a pivotal role in shaping the educational landscape, serving as catalysts for change and progress in the learning environment.

As the K to 12 program continues to unfold, it heralds a new era of educational excellence in the Philippines, propelling students towards a brighter future filled with opportunities for growth and success. Through a concerted effort to align with international best practices and empower educators to deliver quality instruction, the nation is poised to cultivate a generation of skilled professionals capable of making a meaningful impact on a global scale.

The full implementation of Republic Act No. 10533, also known as the Enhanced Basic Education Curriculum, plays a crucial role in enhancing the quality of secondary education in the Philippines. One of the standout features of the K to 12 Curriculum is the Spiral Progression Approach, which revolutionizes the teaching methods across various subject areas. This approach ensures that students build upon their knowledge and skills progressively, leading to a deeper understanding of the concepts.

However, despite the positive changes brought about by the new curriculum, teachers are facing challenges such as the insufficient supply and delayed issuance of teaching guides. Additionally, the lack of proper training for implementers hinders the effective delivery of the curriculum. These obstacles highlight the importance of continuous support and resources for educators to successfully implement the curriculum.

In contrast to the previous curriculum, which overloaded students with a vast amount of knowledge within a limited timeframe, the K to 12 Curriculum focuses on holistic learning. By shifting the emphasis from content-centric to a more integrated approach, students are encouraged to develop critical thinking skills and acquire competencies that are essential for lifelong learning and success in their future endeavors. This shift in educational philosophy aims to address the shortcomings of the old system and better prepare students for the challenges of the modern world.

The K to 12 Education Program addresses these shortcomings by reforming the basic education curriculum. The following are some features of the curriculum:

The K to 12 Basic Education Program is a major education reform implemented in 2012 in the Philippines. It serves as a response to the urgent need to improve the quality of Philippine basic education. The K-12 program aims at 'decongesting and enhancing the basic education curriculum for learners to master basic competencies, lengthening the cycle of basic education to cover kindergarten through year 12 (SEAMEO INNOTECH, 2012).

According to SEAMO INNOTECH's K to 12 Toolkit, the new curriculum ensures smooth transition between grade levels and continuum of competencies through spiral progression where learning of knowledge, skills, values, and attitudes increase in depth and breadth', ensuring integrated and seamless learning.

K to 12 stands for universal kindergarten, six (6) years of elementary and six (6) years of secondary education – all of which are compulsory. Prior to the implementation of K-12 program in 2012, basic education in the Philippines only had four (4) years of secondary education.

On top of the lengthening of the basic education cycle, the curricula of the subjects in this new program differ from those of the old one. As a whole, the Philippine K to 12 science curriculum is learner-centered and inquiry-based, emphasizing the use of evidence in constructing explanations. Unlike in the old curriculum where learning tended to be more focused on fragmented and disintegrated content, K to 12 curriculum fosters the development of critical thinking, creative thinking, problem solving, team-work and informational literacy .

The K-12 curriculum follows the spiral approach. Jerome Bruner is the proponent of this approach with principles derived from John Dewey. In the book The Process of Education, Bruner argues that curriculum should be designed in a way that it pursues a spiral progression that starts from simple to complex and requires revisiting prior knowledge. In short words, students continuously build upon what they already know.

In the K to 12 Education Program, the spiral progression approach by John Bruner will be used in teaching Science, Mathematics, Araling Panlipunan (Social Studies), *MAPEH* (Music, Arts, Physical Education, and Health) and *Edukasyon sa Pagpapakatao* (Values Education).

In the old curriculum, learners were taught Science and Mathematics using the discipline-based approach. In the K to 6 Mathematics curriculum, the subject had to be learned comprehensively and with much depth. On the other hand, in the new Mathematics curriculum, there is a continuity of learning from K to Grade 10. On top of this, the Spiral Progression Approach is followed, in lieu of the discipline-based approach utilized in the old curriculum.

The new Science curriculum 'strongly links science and technology, including indigenous technologies to preserve the country's distinct culture'. In the old curriculum, Science was taught using the discipline-based approach. In the new curriculum, spiral approach will be applied in teaching science concepts and applications in all subjects. SEAMO INNOTECH's K-to-12 kit states further that 'concepts and skills in Life Sciences, Physics, Chemistry, and Earth Sciences are presented with increasing levels of complexity from one grade level to another, thus paving the way for deeper understanding of key concepts'(SEAMO INNOTECH, 2012).

Integrated Language Arts aims for the development of oral and written communicative competence of learners in three languages: Mother Tongue, Filipino, and English (SEAMO INNOTECH, 2012). In the new curriculum, the Spiral Progression Approach of the competencies across the levels should be observed. However, there is grater emphasis on reading comprehension of various texts, writing and composition, study and thinking strategies which are all in support of critical and creative thinking development in the high school level.

With regard to the new Music and Arts curricula, the learner both receives and constructs knowledge, skills, and values necessary for cultural literacy and artistic expression. The curricula have a student-centered design which is based on John Bruner's spiral progression. In addition to this, the curricula are also grounded on performance-based learning. The learner, therefore, is empowered, through active involvement and participation, to effectively correlate music and art to the development of his/her own cultural and expand his/her vision of the world (SEAMO INNOTECH, 2012).

The spiral method of learning information is intuitive and repetitive in nature. Many basic concepts are taught in a spiral method. An example of a spiral curriculum is when a student first learns the alphabet. The student learns that "A" is for apple, the pronunciation "A" and that "A" is also written "a". The student continues to revisit the initial concept of "A" adding to it each time. A process of repetition is established.

Another example of spiral curriculum is when a mother teacher her four-year-old child the parts of the plant. The basic information obtained at this early age was spiralled into a broader knowledge of botany and biology. With recursive visits back to the foundational knowledge of plant. These are spiral in nature because as the student progresses in depth of knowledge, the fundamental points are revisited and new information is attached to the original topic.

Taba (2002) believed that inductive thinking was the way to develop higher order thinking skills. These are features of a spiral curriculum. First, the concepts are revisited. The students revisit the concepts and the subject's content frequently throughout the academic 10 year. Bruner suggested that such a curriculum would be structured "around the great issues, principles and values that a society deems worthy of the continual concern of its members (Emling, 2007). Second, each visitation increases depth of knowledge. The prior concepts and subject content are enriched with new knowledge with each visitation. Each recursive visitation has added knowledge and skills that increase learning opportunities. These drive the student toward mastery of the subject matter. Third, all knowledge and skills are tied back to the foundational basis, the knowledge of the students. New knowledge and skills are linked directly to the learning of previous concepts and subject content of the previous spiral.

Statement of the Problem

This study sought to assess the Spiral Progression Approach in teaching of Science in Bugallon I and II Districts in Schools Division Office I Pangasinan during the School Year 2024-2025.

Specifically, it sought to answer the following sub-problems:

1. What is the profile of the Science teachers in terms of the following:
    1.1 highest educational attainment;
    1.2 number of years of experience in teaching of Science; and
    1.3 relevant in-service training attended.
2. What is the extent of implementation of the Spiral Progression Approach in the teaching of Science in private schools in the new normal education?
3. Is there a significant relationship between the profile of Science teachers and their extent of implementation of Spiral Progression Approach in the teaching of Science in private schools in the new normal education?
4. What are the advantages and disadvantages of Spiral Progression Approach?
5. What are the common teaching strategies used in teaching Spiral Progression Approach?

5. Based on the findings, what digitized materials in Science using Spiral Progression Approach can be proposed?

METHODOLOGY

This chapter discusses the research design, sources of data, instrumentation and data collection and the tools for data analysis.

Research Design

The study used descriptive method of investigation. Descriptive research design is intended to gather information about existing conditions. It described the situation as it exists at the time of the study and to explore the causes of the phenomenon.

This study assessed profile of the Science teachers in terms of highest educational attainment, number of years of experience in teaching of Science, and relevant in-service training attended; the extent of implementation of the Spiral Progression Approach in teaching Science in the new normal education; significant relationship between the profile of the Science teachers and the extent of implementation of the Spiral Progression Approach; the advantages and disadvantages of Spiral Progression Approach; the common teaching strategies used in teaching Spiral Progression Approach.

Instrumentation and Data Collection

The research instrument used in gathering the data in this study was a researcher-made questionnaire, since there is no standard questionnaire. Part 1 of the questionnaire elicited valuable data relative to the profile of the Science teachers such as highest educational attainment, present position, number of years of experience in teaching of Science, relevant in-service training attended.

The second part involved the extent of implementation of the Spiral Progression Approach in teaching Science .

The third part covered the advantages and disadvantages of Spiral Progression Approach.

The last part covered the common teaching strategies used in teaching Spiral Progression Approach.

The researcher-made questionnaire was presented to the adviser first then to the members of the Reading Committee for initial evaluation. Then the instrument was submitted for final evaluation and validation by other Science teachers on questionnaire construction and content- related to the implementation of Spiral Progression Approach. The product of this process was the questionnaire in its final form.

The approval and permission to conduct the study were obtained by the researcher from the Schools Division Superintendent of Pangasinan I Division.

Tools for Data Analysis

To derive valid and accurate results, appropriate statistical measures will be employed.

To answer sub-problem 1 regarding the professional profile of the Science teachers, frequency counts and percentages, using the formula below, was used.

$$\text{Percentage} = \frac{F}{N} \times 100$$

Where:

F = Frequency

N = total number of respondents

` To answer sub-problem 2, the implementation of Spiral Progression Approach, the average weighted mean (AWM) will be used.

$$\frac{\sum WM}{I}$$

Where: ∑WM = Weighted Mean

I = no. of items/indicators

Rating	Mean Range	Descriptive Equivalent
5	4.21 - 5.00	Fully Implemented (FI)
4	3.41 - 4.20	Greatly Implemented (GI)
3	2.61 - 3.40	Moderately Implemented (MI)
2	1.81 - 2.60	Slightly Implemented (SI)
1	1.00 - 1.80	Not Implemented (NI)

To answer sub-problem 3, on the significant relationship between the profile of the teachers and their extent of implementation of Spiral Progression Approach, Chi-square was used.

To answer sub-problem 4, advantages and disadvantages of Spiral Progression Approach, the average weighted mean (AWM) was used using the following mean scale.

Rating	Mean Range	Descriptive Equivalent
5	4.21 - 5.00	Always (A)
4	3.41 - 4.20	Often (O)
3	2.61 - 3.40	Sometimes (S)
2	1.81 - 2.60	Rarely (R)
1	1.00 - 1.80	Not at All (NA)

To answer sub-problem 5, the common teaching strategies used in teaching Spiral Progression Approach, the frequency counts and percentages was used.

RESULTS AND DISCUSSION

This chapter presents the elements of presenting and interpreting data to answer the sub-problems posited in the chapter of the study.

Profile of the Science Teachers

The profile of the Science teachers in Bugallon I and II Districts in terms of highest educational attainment, present position, number of years of experience in teaching of Science, and relevant in-service training attended was presented in Tables 1a-1d.

Table 1a. Profile of the Teachers in Terms of Highest Educational Attainment

Highest Educational Attainment	Frequency	Percentage Rate
With M.A/Med/MS Units	18	54.55
MAEd/Med/MS	11	33.33
With Doctoral Units	4	12.12

Total	**33**	**100**

It can be seen in Table 1a that majority of the Science teachers have MA/MEd units with 18 or 54.55%. There is also 11 or 33.33% who are MAEd/MEd graduates. It is also reflected in the table that 4 or 12.12% is pursuing their doctoral degree.

Table 1b. Profile of the Teachers in Terms of Present Position

Highest Educational Attainment	Frequency	Percentage Rate
Master Teacher II	3	9.09
Master Teacher I	5	15.15
Teacher III	13	39.39
Teacher II	4	12.12
Teacher I	8	24.24
Total	**33**	**100**

Table 1b presents the profile of the Science 3 teachers in terms of present position.

It is reflected in the table that majority of the Science 3 teachers are Teacher III with 13 or 39.39%. Next is Teacher I with 8 or 24.24%. There is also 5 or 15.15% Master Teacher I, 4 or 12.12% Teacher II, and 3 or 9.09 Master Teacher II.

Table 1c. Profile of the Teachers in Terms of Number of Years of Experience in Teaching of Science

Number of Years of Experience in Teaching of Science	Frequency	Percentage Rate
10 years and below	16	48.48
11-20 years	13	39.39
21-30 years	4	12.12
Total	**33**	**100**

Most of the Science 3 teachers with 16 or 48.48% have 10 years and below teaching experience in Science while 13 or 39.39% of them have been teaching for 11-20 years. The other 4 or 12.12% has been in the service for 21-30 years.

Experience really matters in teaching if the teachers knew how to make use of his experience bringing out the best in learners.

Table 1d. Profile of the Teachers in Terms of Relevant In-service Training Attended

Level	Frequency	Percentage
International	12	36.36
National	11	33.33
Regional	27	81.81
Division	33	100

*** Multiple Responses**

In terms of relevant in-service training attended, it is evident that the Science teachers have actively participated in various levels of professional development opportunities. At the Division level, all Science teachers have taken part in significant events such as the Division Science Congress, showcasing their commitment to enhancing their teaching skills and knowledge. Moving up to the Regional level, a substantial majority of 81.81% of teachers have engaged in seminars like the Regional Mass Training for Science in the K to 12 Curriculum, indicating a strong interest in staying updated with the latest educational practices.

Implementation of the Spiral Progression in the Teaching of Science

The extent of implementation of the Spiral Progression Approach in the teaching of Science is presented in Table 2.

Table 2. Extent of Implementation of Spiral Progression Approach

Indicators	Weighted Mean	Descriptive Equivalent
1. Teaches and learns process is based on the Spiral Progression Approach.	3.59	GI
2. Utilizes research-based practices and materials.	3.41	GI
3. Utilizes individual and cooperative learning activities to improve the competency of the learners for higher learning.	3.51	GI
4. Ensures vertical articulation and seamless progression of competencies.	3.56	GI
5. Provide variety of learning experiences.	3.23	MI
6. Utilizes of highly academic universal standards in teaching to produce globally competitive graduates.	3.31	MI
7. Explores integrative and interactive strategies for meaningful and holistic development of the students.	3.72	GI
8. Provides differentiated activities for the learners.	3.54	GI
9. Conceptualizes the curriculum to make it culture-sensitive, responsive, flexible and suitable using Spiral Progression Approach.	3.56	GI
10. Implements Spiral Progression Approach in all subject areas being taught.	3.44	GI
11. Reinforces what is actually learned through the use of indigenous materials.	3.44	GI
12. Employs Content-Based Instruction in teaching.	3.44	GI
13. Allows gradual mastery from one grade level to the next.	3.59	GI
14. Builds students prior knowledge and perspective into structural.	3.57	GI
15. Infuses local knowledge and perspective into structural layer of the institution.	3.33	MI

16. Creates a more inclusive environment through presentation of the different world views to enhance and enrich the educational experiences.	3.26	MI
17. Conceptualizes the curriculum to make it culture-sensitive, responsive, flexible and suitable community.	3.23	MI
18. Learns through repeated exercises of a concept.	3.31	MI
19. Learns best by building on students' current knowledge.	3.62	GI
20. Returns to basic ideas as new subject and concepts are added.	3.90	GI
21. Implements/use the specific features of the Spiral Progression Approach in teaching Science	3.82	GI
22. Has knowledge of the learning contents of the Grade level subject areas that lend themselves to the Spiral Progression Approach.	3.82	GI
23. Coordinates with the teachers of preceding and succeeding Grade levels.	3.92	GI
Average Weighted Mean	**3.37**	**MI**

Legend

Point Value	**Mean Range**	**Descriptive Equivalent**
5	4.21-5.00	Fully Implemented (FI)
4	3.41-4.20	Greatly Implemented (GI)
3	2.61-3.40	Moderately Implemented (MI)
2	1.81-2.60	Slightly Implemented (SI)
1	1.00-1.80	Not Implemented (NI)

The degree of implementation of the Spiral Progression Approach is outlined in Table 2. It is evident that the Spiral Progression Approach is moderately implemented, as indicated by the average weighted mean of 3.37. The table further illustrates that most of the indicators of the Spiral Progression Approach were rated as moderately implemented. The highest mean rating was assigned to the indicator "Coordinates with the teachers of the preceding and succeeding grade levels about topics," which received a rating of 3.92, signifying a high level of implementation. Following closely is the indicator "Returns to basic ideas as new subjects and concepts are introduced," which received a rating of 3.90, also indicating a high level of implementation. Conversely, the lowest mean rating was attributed to the indicator "Conceptualizes the curriculum to make it culture-sensitive, responsive, flexible, and suitable to the community," with a rating of 3.23, indicating a moderate level of implementation. These findings suggest that the Spiral Progression Approach holds significant potential in enhancing the learners' performance. By connecting topics across different year or grade levels, students can delve deeper into a diverse range of concepts, topics, skills, and attitudes that are considered essential until they are fully mastered.

Advantages and Disadvantages of Spiral Progression

The advantages and disadvantages of Spiral Progression Approach are presented in Tables 3a-3b.

Table 3a. Advantages of Spiral Progression

Indicators	**Mean**	**Descriptive Equivalent**
1.Avoids disjunction between stages of schooling	3.34	Often
2. Allows learners to learn topics and skills appropriate to their development/ cognitive stages.	3.60	Often
3. Allows learners to learn topics and skills as they are revisited and consolidated.	3.27	Sometimes
4. It strengthens retention and mastery of topics and skills as they revisited and consolidated	3.06	Sometimes
5. It allows learners to gain valid experiences.	3.26	Sometimes
AWM	**3.31**	**Sometimes**

Legend

Rating	**Mean Range**	**Descriptive Equivalent**
5	4.21 - 5.00	Always (A)
4	3.41 - 4.20	Often (O)
3	2.61 - 3.40	Sometimes (S)
2	1.81 - 2.60	Rarely (R)
1	1.00 - 1.80	Not at All (NA)

Table 3a presents the participants' perceptions regarding the advantages of the spiral progression approach. The data indicates that participants generally rated the advantages of this approach as "Sometimes," yielding a composite mean of 3.31. This suggests that teachers view spiral progression as occasionally beneficial, rather than consistently so. In essence, its effectiveness seems to vary depending on the specific circumstances or context in which it is applied.

Furthermore, it is worth noting that not all teachers agree on the first advantage listed, which highlights how spiral progression helps avoid discontinuities between different stages of schooling. Particularly, public school teachers tended to assign this advantage the lowest rating, indicating a divergence in opinion within the teaching community. This discrepancy underscores the nuanced nature of educational methodologies and how they are perceived and implemented in diverse educational settings.

Table 3b. Disadvantages of Spiral Progression

Indicators	Mean	Descriptive Equivalent
1. Does not promote sufficient review once units are completed.	3.13	Sometimes
2. The rate of introducing new concept is often either too fast or too slow.	3.46	Often
3. All concepts are allotted the same amount of time whether they are easy or difficult to master.	3.26	Sometimes
4. It is difficult to sequence instruction to ensure that students acquire necessary pre-skills before introducing difficult skills.	3.59	Often
5.Many students fail to master important concepts	3.40	Sometimes
AWM	**3.37**	**Sometimes**

Legend

Rating	Mean Range	Descriptive Equivalent
5	4.21 - 5.00	Always (A)
4	3.41 - 4.20	Often (O)
3	2.61 - 3.40	Sometimes (S)
2	1.81 - 2.60	Rarely (R)
1	1.00 - 1.80	Not at All (NA)

Table 3b reveals how the participants perceived the disadvantages of spiral progression approach. It can be seen in the data that teacher- respondents rate the disadvantages as “Sometimes” with a composite mean of 3.37. This reveals that respondents perceive the disadvantages of spiral progression as “Sometimes.”

Common Teaching Strategies Used

Table 4. Common Teaching Strategies Used

Strategies	Frequency	Percentage
1. Discovery/Inquiry Learning	30	90.91
2. Collaborative Learning	28	84.85
3. Experiential Learning	29	87.88
4. Cooperative	27	81.82
5. Jig-Saw Puzzle	23	69.70
6. Buzz Session	23	69.70
7. Child-Centered Approach	26	78.79
8. Round-robin	24	72.73
9. Think-pair-share	24	72.73
10. Role play	28	84.85
11. Portfolio’s and Journal	28	84.85
12. Whole Brain Teaching	24	72.73
13. Group Investigation	27	81.82

Table 4 shows the frequency and percentage of respondents. Out of 33 respondents, majority of teachers have been using the discovery/inquiry learning, which has a total of 30 or 90.91%. Collaborative learning has a total of 28 or 84.85%. Another is experiential learning with 29 or 87.88%, cooperative and group investigation with 27 or 81.82%, jigsaw puzzle with 23 or 69.70, buzz session with 23 or 69.70%, child-centered with 26 or 78.79%, round robin with 24 or 72.73%. Portfolio’s and Journal has a total of 28 or 84.85%. Think pair-share a with 24 or 72.73%, role play has a total of 28 or 84.85%. Testing of independence or preference through “Goodness of Fit” test, reveals that among the strategies, there are only five preferred strategies. They are discovery/inquiry learning; collaborative learning; role play; portfolio’s and journal, and experiential learning.

Conclusions

Based on the findings of the study, the following conclusions were drawn:

1. Generally, most of the Science teachers are educationally qualified in terms of educational attainment, present position, number of years of experience, relevant in-service trainings attended and specialization.
2. Spiral Progression Approach is moderately implemented by the Science teachers
3. Public school teachers perceive that sometimes spiral progression in science has advantages and disadvantages.
4. Significant statistically, discovery / inquiry learning, collaborative learning and experiential learning are the most commonly used and most effective teaching strategies of public school teachers under the context of spiral progression program.
5. The proposed intervention strategies will help the teachers implement the Spiral Progression Approach in teaching Science.

Recommendations

On the basis of the foregoing findings and conclusions, the following policy statements are recommended:

1. Encourage teachers to finish their graduate studies by providing scholarships to teachers who are interested to continue their studies to uplift their professional qualification.
2. Send teacher to trainings/seminars related to the implementation of the Spiral Progression Approach to improve their competence and skills.

3. More seminars/trainings should be given free to teachers to address the needs identified in the implementation of Spiral Progression Approach.
4. Similar studies should be conducted in other school or division by any interested researcher in order to find out if the Spiral Progression Approach as a feature of the K to 12 Curriculum is well-implemented.

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