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Lived Experiences of Junior High School Specialized Science Teachers Teaching Science Using the Spiral Progression Approach

Teomar James A. Rosas

Abstract

This study aimed to describe the lived experiences of the junior high school specialized science teachers teaching science in spiral progression approach under the Department of Education (DepEd) K to 12 curriculum. A descriptive phenomenological research approach was used in the study with five specialized science teachers with different science specializations who were purposively selected using snowball sampling. A face-to-face interview with in-depth questioning in a local dialect (Cebuano) were employed for data gathering that allowed further probing. The responses were transcribed and analyzed. Findings suggested that majority of specialized science teachers encountered such as unavailability of learning resources and struggle in preparation on their non-specialize science topics. However, they learned to become flexible and resourceful in improving their accustomed science teaching practices. They also learned to communicate and collaborate with fellow science teachers during mentoring and coaching as their means of coping strategies. Furthermore, science teachers still preferred the old curriculum in teaching science concepts. Results of the study will provide DepEd policy makers and stakeholders in assessing the capability of secondary science teachers in improving their science classroom instruction through timely and relevant training programs.

Keywords: *Spiral Progression, Curriculum, Teaching, Science Teachers, Science Specialization*

Introduction

Science is one of the subjects that underwent major revisions and innovations in the course of the implementation of the new K-12 curriculum in the Philippines. One of these changes is the decongestion of the competencies and arrangement where science concepts and applications are given in a spiral progression approach. Under the K to 12 science curriculum, concepts and skills in Biology, Physics, Chemistry and Earth Science are presented with an increasing levels of complexity from grade 7 to grade 10, wherein the four major areas are being taught per grading period.

In Philippine setting, DepEd perceives the spiral progression approach as a solution to the education problem. The new curriculum requires every specialized science teacher to have a mastery of subject matter and teaching strategies in all of the four areas at a sufficient level (Duze, 2012). Montebon (2014) stated that the spiraling of the competencies in the new science curriculum greatly affected in - service teaching efficacy science teachers who are specialized in the different branches of science, namely, Biology, Chemistry, Earth Science and Physics. If the specialized science teachers do not know the content or employ specific teaching strategies, most students will not learn from the subject (Jolly, et.al, 2004).

In terms of instruction, Resurreccion and Adanza (2015) asserted that there has been a mismatch in the teacher preparation, since present junior high school teachers teaching science subjects in secondary schools were graduated from different colleges and universities

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who prepared them to be specialized in a specific field like Integrated Science, Biology, Chemistry and Physics. However, in the K to 12 curriculum, specialized teachers in their respective science fields are required to teach science subject in a spiral progression approach. Therefore, teaching science in all of its branches or fields may be a tough job for the specialized teachers without a deep background and mastery of the subject content and skills

This study aims to describe the present lived experiences encountered by the specialized secondary science teachers in teaching science using the spiral progression approach and how they overcome the challenges from a specialist to generalist type of science teachers in the new curriculum. The results of this study are the views of specialized science teachers based from their daily experiences regarding the spiral progression approach from public secondary schools. It is very important to hear their insights and views about the SPA because teachers are the prime movers of the said curriculum. If teachers are not knowledgeable of the said curriculum they will not be able to implement it correctly and properly in their teaching methods.

Literature Review

The new K to 12 science curriculum is a learner-centered and inquiry-based approach that emphasizes the use of evidence in constructing explanations. Concepts and skills in Life Sciences, Physics, Chemistry and Earth Science were presented in increasing levels of complexity from one grade level to another through spiral progression (Montebon, 2014). The spiral progression approach exposed students into a wide variety of concepts, topics and disciplines by studying over and over again but with different deepening of complexity (Resurreccion & Adanza, 2015).

Braund (2008) highlighted that Spiral Progression Approach (SPA) followed a progressive type of curriculum anchored to John Dewey that engulfs the total learning experiences of the individual. He also added that spiral curriculum was a design framework which will help science teachers construct lessons, activities or projects that targeted the development of thinking skills that involves progression and continuity in learning science.

Previous findings of Snider (2004) as cited by Resurreccion and Adanza (2015) pointed out that the Spiral Progression Approach (SPA) has its advantages and disadvantages, one of which was that SPA allowed the learners to learn new topics and skills appropriate to their developmental and cognitive stages. It also strengthened the retention and mastery of topics and skills as the students were revisited and consolidated in every year. However, the problem of this approach showed on the rate of introducing the new concepts that was often either too fast or too slow to master given a same amount of time in teaching.

According to De Dios (2013) cited from the study of Resurreccion and Adanza (2015), spiral curriculum can only be devoted for only one quarter of a year in each branch of science thus exposure to the student per year in each science areas were only limited. This claim was supported by Orbe, Espinosa and Datukan (2018) that the biggest disadvantage of a teaching spiral curriculum was the lack of opportunity to cover a variety of science topics within one discipline in a year because each science topics built on top of each other and every quarter was simply not enough time to cover the aid of student in another science field.

However, the study of Almeida et al. (2013) showed that K to 12 education curriculum lessened the contact of science teachers in teaching science into four hours per week in contrast to the old curriculum, Basic Education Curriculum (BEC) which was six hours per week of lecture and laboratory, this only implies that student's exposure to science topics and related activities are limited under the new curriculum thus may affect the learning process of the students.

Dunton and Co (2018) concluded that failure in massively distributing teaching guides and learning modules to teachers, not well-planned implementation of SPA, lack of qualified teachers, incompetency of teachers due to the lack of academic conferences and seminar-workshops, and inadequate time spent for teachers training

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were among the top five problems that surfaced in the implementation of the SPA in teaching science among schools.

Furthermore, recent findings on the study of Valin and Janer (2019) revealed the three difficulties encountered by the teachers both from small and big schools on the implementation of the SPA such as time allotment in the use of some teaching strategies to cover the topics, time constraint in the use of differentiated instructions for evaluation and preparation of interactive activities that will cater all types of learners. Most of them agreed that enough time should be allotted so that they can effectively use strategies to finish the science concepts and to give appropriate evaluation of learning outcomes.

Theoretical Framework

The theoretical foundation of this study is anchored the theory of Spiral Progression which was proposed by Jerome Bruner with principles of Progressive Education derived from John Dewey. The progressive education as described by Dewey (1938) is a product of discontent with traditional education which imposes adult standards, subject matter, and methodologies. Dewey believed that progressive education should include socially engaging learning experiences that are developmentally appropriate for young children. Dewey thought that effective education came primarily through social interactions and that the school setting should be considered a social institution (Flinders & Thornton, 2013; Williams, 2017).

Hatuina (2013) also emphasized the idea from Bruner (1960) on which he suggested 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, students must continuously build concepts upon what already know and return the basic ideas until they grasped the full formal concept. Therefore, subjects would be taught at levels of gradually increasing difficulty. Bruner believed that the most effective way of constructing student's knowledge is to discover by themselves rather than being told it by the teacher. This concept of discovery learning became also known as constructivist approach which one of the characteristics of the spiral progression approach (SPA) under the K to 12 curriculum.

Research Questions

This study aimed to determine the lived experiences of specialized science teachers teaching science subject in junior high school using the spiral progression approach. Specifically, it sought to answer the following research questions:

1. What are the lived experiences of junior high school specialized science teachers teaching science using the spiral progression approach?
2. What are the challenges encountered by specialized science teachers teaching science using the spiral progression approach?
3. What are the coping strategies of specialized science teachers in teaching science using the spiral progression approach?

Methodology

This section presents the methods, participants and procedures used in this study. The presentation includes the research design, sampling used, data gathering procedures and analysis of data.

Research Design

This study used a qualitative descriptive phenomenological method by Giorgi (2012) that aims to describe the meaning, structure and essence of the lived experiences of a person or a group of people around a specific phenomenon. Thus, the study attempts to determine and understand the lived experiences of specialized secondary science teachers teaching science using the spiral progression approach (SPA) implemented under the K to 12 curriculum.

Sampling

The study was conducted in two public

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secondary schools of the Municipality of San Isidro, Leyte namely the Muertegui National High School situated in Brgy. Daja Diot and San Isidro National High School in Brgy. Capinahan. These two public schools were the only public secondary schools in San Isidro, Leyte. Purposive sampling was used for the selection of participants since the study worked in a small samples of participants to achieve an in-depth understanding of the phenomenon and create a rapport with the participants (Hesse-Biber & Leavy, 2011).

There were five secondary science teachers, two science teachers where from Muertegui NHS and three science teachers from San Isidro NHS with different science specializations such as Biological Science, Chemistry, General Science and Physical Science who were purposively selected through a snowball sampling. These five teachers holding a Teacher I to Teacher III teaching positions were originally teaching science subjects in their major fields of expertise under the old curriculum and later shifted in teaching general science using the spiral progression approach since the implementation of the new curriculum. They were teaching a wide range of science topics in different grade levels in the junior high schools.

Data Collection and Instruments

The data were collected through a series of face-to-face interviews that provide insights in lived experiences (Englander, 2012) and to obtain an authentic in-depth information from the target participants (Hesse-Biber, 2012).

The teacher - participants were interviewed at their respective schools during their available time. An open – ended questions were asked in a random scheduled face-to-face informal interview to make sure that participants feel comfortable and ease during the duration of the interview process. The responses and details of the discussion were audio-recorded with the consent of the participants using mobile phones. The questions were asked in mother tongue (Cebuano). The interview process lasted for an average of 20 minutes.

The data collection ended until saturation point has achieved. The participants' answers were transcribed in Cebuano dialect while the English translations were verified by the teacher-participants for appropriateness and correctness from the responses.

Data Analysis

The data gathered from the recorded interviews were carefully analyzed using descriptive phenomenological analysis by Giorgi (2012). The researcher carefully read the transcripts interview in order to extract significant statements from the different experiences of the teachers. Then, researcher assigned codes and expressed these codes to meaning units and synthesized related themes on the experiences of participants on teaching spiral progression approach. Lastly, the generated themes were reviewed by the teacher-participants and refined to ensure that synthesized themes were related to the research questions.

Ethical Considerations

The secondary teacher served as participants of the study were told that their responses will be audio - recorded and the reason for that is the experimenter to be able to recall what participants have said. They were also told that their responses will be treated anonymously and they can withdraw from the interview at any time. After completion of the interview, they were thanked for their time, they have been debriefed about the study and asked if there were any questions left unanswered.

Reflexivity

As a science teacher and a researcher, my most important learning is to acknowledge that research has both its power and limitation for social change and development. I saw its importance in probing the lived experiences of my fellow secondary specialized science teachers who have direct experiences of teaching science using the spiral progression approach. However, there were a number of times during the data collection when I felt I could do nothing but to empathize with the plight of the participants and assure them that the study will definitely serve as a tool

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for change if utilized accordingly by policymakers and curriculum implementers.

Results and Discussion

Table 1. *Summary of Responses and Themes*

Major Themes	Meaning Units				
	P1	P2	P3	P4	P5
A little bit of everything	P1 determined that spiral progression approach lets you know tidbits of information and concepts about the subject in every year level.	P2 stated that spiral progression makes every year had little of information of everything but consistently increasing in difficulty.	P3 defined spiral progression as an approach that starts from the bottom and followed a process its way to the top.	P4 gave definition to spiral progression approach as a continuous process of learning for the students.	P5 said that spiral progression makes the learning of the students more complex as school years went on.
Facing a mismatch battle	P1 felt discouraging as she always try to repeat the basic concepts.	P2 found difficulty on teaching lessons not in her field of specialization.	P3 encountered difficulties in topics dealing with physics.	P4 faced challenges dealing with numbers and computation in physics.	P5 disliked physics as there are many formulas that needed to be computed.
Beyond comfort zone	P1 just tend to review her students until they reached their dairy point.	P2 made the students enjoy and at the same time learn with her game-oriented instruction.	P3 commenced a paired tutorial to the fast-learning student to the slow-learning student.	P4 scanned the books and find the most difficult topics that needed to be research.	P5 asked questions to her colleagues that were master at the topic that she had difficult in dealing the lessons.
Openness to new things	P1 emphasized that it gives a positive outlook and open mind in regard to changes.	P2 stated that spiral progression as an exciting one.	P3 learned the higher science field beyond her specialization.	P4 wanted to prove that teachers were flexible for changes.	P5 adjusted to the new things and new learnings.
Insuffiency of time	P1 picked new curriculum as it builds a block that consist of new ideas every year.	P2 chose the new curriculum where students also learn new skill and not only new information.	P3 selected old curriculum as it only focuses on a certain science specialization in whole school year-round.	P4 preferred the old curriculum as students tend to focus on a certain science topic.	P5 picked the old curriculum as students learned the difficult concepts of the certain specialization in a year.

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A little bit of everything

Specialized science teachers had given different meanings but bearded with the same thoughts. The specialized teachers tend to define spiral progression as a continuous process from the first and basic up to the last and complex science concepts. Spiral progression approach also gave the students a little of informations for every quarters of what will be ahead of them in upcoming years. Science teachers emphasized that the foundation of the students since grade 7 should be strong as it will be the building block of the students throughout the student's junior high school career.

"… Unlike sa spiral progression, pag grade 7 pa lang naa nay force and motion. So, murag nindot jud siya kay tidbits of information, tidbits of concepts kay naintroduce na sa pag grade 7 pa lang". ***("Unlike spiral progression, in grade 7 they tackle about force and motion. It is nice since there will be tidbits of information, tidbits of concepts that had been introduce in grade 7").*** **(P1)**

"… Spiral Progression in teaching in which in every year level a little of everything of the subject so in spiral approach there is increasing of difficulty of subject". ***("In teaching, spiral progression makes the student to learn a little of everything and there is an increasing of difficulty of the subject").*** **(P2)**

"… Ang learning sa spiral progression kay muagi jud ug process. Ari magsugod sa ubos padong sa igbaw hangtud makadiscover ka kung unsa na siya about ato ang learning". ***("The learning in spiral progression has a process. It will start from the very basic concepts until they discover the essential learning"). (P3)***

Teachers teaching science in spiral progression approach often described it as a curriculum in which students' learning process occurs in a spiral way of levelling science knowledge and skills.

"… Para sa akoa ang spiral progression ok gad siya pero mura bag naay continuation ang learning sa bata kumbaga from grade 7 which is simple then nagtika complex as nag tika higher siya". ***("For me, I am okay with spiral progression approach since there is a continuation on the learnings of my students. Wherein, in grade 7, the students were introduced to simple science concepts then to a more complex concept that gets higher from one level to another"). (P5)***

Facing a mismatch battle

The SPA requires a heavy preparation since specialized science teachers must learn and teach four science major areas (Resurreccion & Adanza, 2015). Some of teachers as being a non-specialized make it even harder to teach and grasps science lessons that were out of their expertise. Specialized science teachers also encountered a lot of challenges in terms of sharing what they learned during their undergraduate studies to their students. They experienced difficulty in teaching basic skills to complex science concepts like science teachers who specialized in Biology that presently teaches chemistry lessons were mostly hesitant to integrate their lessons and gave additional informations since their background knowledge is very limited.

"… Kay usa nako nga problems nga mameet ani nga spiral progression kay makalimot ang bata sa ilahang lesson last year". ***("One of my problems in this spiral progression is that students forget their lessons from last year").*** **(P1)**

"… Ang huna huna sa teacher is naka kuan na sa mga major. Kani nga major in a certain level gud all the subjects or major sa science naa man gud nay earth science. There is biology, chemistry and kuan pananglitan ang teacher is more on biology, chemistry, and kuan pananglitan ang teacher is more on biology inig abot niya sa physics, chemistry, mas murag mofind siya og difficulty in teaching". ***"The mind of the teacher focuses on its major. All of this major contains Earth Science. There is also biology and chemistry. If the teacher is more on biology or chemistry and at the time that he/she will teach physics or chemistry. He/she will find difficulty in teaching").*** **(P2)**

"… Actually naa man koy idea sa different specialization sa science pero lisod jud kaya ng biology more on plants and living things unya karon naa nay work, force and motion karon lisod na pag adjust". ***("Actually, I have a knowledge on the different specialization. Biology talks about***

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plants and living things. Then now, we have work, force and motion. It hard to adjust in our part"). **(P3)**

For science teachers who were specializing Biology, they often experienced difficulties in dealing with numbers, formulas, and computations that commonly involved in the field of Physics as a result they tend do not focus on the computations and skip the topics under Physics lessons.

"… Challenges? Kanang mo deal na ug mga numbers, computations lisod sir. Basta more on computations dili kayo ko maayo anang computations". ***("The challenges that I encountered in teaching science were mostly dealing about numbers and computations").*** **(P4)**

"… More on problems, kay murag naa siya'y relation sa math naa gyuy solving problem kay when we say physics nay mga formulas, which is I am not a math major". ***(My challenges are like more on mathematical problems since physics have a relationship to math for it has also formulas which is I am not a math major").*** **(P5)**

This implies that there is a need for the teachers to reinforce and update their knowledge in the different teaching strategies that is in lined with the learning competencies set by the K-12 curriculum

Beyond comfort zone

In facing such challenges, specialized science teachers also have their own common strategies and teaching styles in order to cope up in their encountered problems as a generalist science teacher. Most of their common strategies used during classes were they review their students prior to the topic that has a connection from the last lesson. They also asked their colleagues who are expert about a certain science topic in for they hardly understand. The specialized science teachers learned to become resourceful in looking ways in the delivery of their lessons in such a way to meet standards prescribed by the curriculum and they also became creative in delivering science lessons and topics that are beyond in their field of specializations.

"… Mobalik ko or magreview ko before having the or tackling the lesson. Mointroduce na pud ka sa basic concepts nga ilang nahebaw an or emu silang iorient or mura sad ug mag recall". ***("I try to review before tackling the lesson. I orient them again to the basic concepts and also recall it to them").*** **(P1)**

"… I always have to employ a game oriented instruction, games jud na siya students learn at the same time enjoy, learning of the students that way is lasting somewhat lasting because they enjoy then they learn". ***("I always have to employ a game oriented instruction. Students learn and at the same time they enjoy. Learning of the students is somewhat lasting because they enjoy and learn").*** **(P2)**

"… Naa koy paired tutoring for example panangnitan sa usa ka section naa koy kuanan nga dili kanang dili ka kuan ang bata so ang katong fast learners ako silang parison". ***("I made a paired tutoring, for example, I let my fast-learning students to tutor the slow-learning students").*** **(P3)**

Specialized science teachers asked for help from their colleagues whom they considered as already master in the certain science topics. They scanned their previous science textbooks and did research using internet for the topics where they find it difficult.

"… Layo layo pa gani sir akong i-scan ang akong libro niya tapos niya ug naa gani mga dili nako carry duol dayun ko kang sir james. Mangutana ko sa mga science teachers, niya mukuan sad kog libro example phoenix basa gyud basa. Mag scan ko daan ug lisod lisod ang tpic before ko mangutana". ***("Earlier my discussion, I already scan my books and references for my lessons ahead of time and if I can't understand anymore the lessons, I will approach any of my co-science teachers for their help and guidance. I asked them about the lessons and scan more").*** **(P4)**

"… Una gyud is seek help especially sa katong murag master na, dako pud ug tabang ang mga trainings ug advance reading pud mag study gyud pud". ***("First, you need to seek help to those science teachers who mastered the lessons or concepts and then, trainings were indeed a great help for you to be prepared and also you must read in advance and study your lesson or topic").*** **(P5)**

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Openness to new things

Although specialized science teachers encountered such challenges and problems being a generalist one, they also learned new things and discovered lessons in life in the teaching profession. Life lessons that made them to adapt to sudden changes, becoming flexible in learning new topics, and accept challenges along the way. They managed to never argue with these changes currently applied to the new curriculum. The specialized science teachers eventually felt in loved other science fields science beyond their areas of specialization.

*"… Aw maona, like pag accept sa consistent changes. Have a positive outlook and open mind in regards this changes kay magbagutbut gane ka nga unsa ba pud uie nga bag o naman sad ni. Naaaaahhh, it will reflect in your way of teaching and how you understand the lesson and the kung maing ana mn gane na. You cannot transfer concepts to your students kay in the first place you have negative thoughts already". **("We have to accept consistent changes. We should have a positive outlook and open mind in regard this changes. If you will consistently complain thus, it will reflect in your way of teaching and how you understand the lesson. You cannot transfer concepts to your students because in the first place, you already have negative thoughts").*** **(P1)**

*"… I find it kuan exciting at the same time for me lasting". **("I find it exciting and at the same time lasting").*** **(P2)**

*"… Kaantigo nako sa higher science like for example chemistry. Sa una makamao-mao ko pero dili man ka kayo maghuna-huna kay dili man imohang major. Sa una di man ko mo mind anang science I, physics, chem kay biology raman jud sa una. Unya karon masugatan na jud nimo sila tanan. Actually ang benifited sad kami pud kay bisan ako di ko ganahan anang chemistry ug lain pang type sa science pero karon maton-an na gyud kay sagol naman, integration naman". **("I learned the higher science fields like chemistry. Unlike before, I don't give so much attention to physics and chem because I am a biology major. Here comes the spiral progression, I encounter all the field of science and it becomes beneficial in my part. Even if I dislike chemistry but I need to learn because it is now being integrated").*** **(P3)**

*"… Ana sila nga ang teacher kuno flexible unya dapat iprove sad na nato nga ingon ana jud. Maahat gyud ta ug tuon atleast kanang naa pud tay makat-onan sa ba nga ah murag marefresh sa ato nga mao diay ni among giskwelahan sa una". **("When you are a teacher, you also need to be flexible so that we could improve ourselves and what's good about spiral progression, as a teacher, I need to study further and learned new science topics even if it is not my field of expertise").*** **(P4)**

*"… Feeling nako is murag imo nalang pud i-adjust imong kaugalingon kung unsa man imong malearn while nagstudy ka pabilin nalang na dihaa agad nalang ka sa curriculum guide". **("I feel that I need to adjust myself from my learning before in college to what I still need to learn").*** **(P5)**

Insuffiency of time

In terms of the teaching science subject, mostly of the specialized science teachers preferred the old curriculum rather than the spiral progression because teaching within their specialization is their comfort zone. More so, the old curriculum only focused to one specific science areas per year. According to science teachers, their former students tend to master the specific field or branch of science for a whole year round unlike the spiral progression that made the students now to learn new skills in progressive and spiral way which somehow minimizes the retention of the skills.

*"… Preferred ko sa Spiral Curriculum. Tungod kay every grade level. You try to build murag kung block pana. You'd try to build that block for every year and you try to cut across sa kanang murag emung gipatas an baa ng level". **("I preferred to spiral curriculum. In every grade level you try to build a block for every year and try to cut across and then increase the degree of difficulty").*** **(P1)**

*"… Mas preferred naku ang spiral kay the learning of the students is lasting and ang advantage sa k-12 kay ang skill. Students not just learn in terms of information or knowledge but also the skill". **("I likely preferred spiral progression because the learning of the students is lasting and the advantage of k-12 is that students not just***

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learn in terms of information or knowledge but also the skill"). **(P2)**

"… Kay kung ako gyud ganahan jud ko sa BEC kay ma focus man nako ug tudlo ang mga bata. Kanang spiral dili man pud sa ingon nga dili ma focus pero kanang mura ba ug complicated man gud". ***("I really like BEC "old curriculum" because I can focus my attention on teaching the students. Unlike in spiral, the lessons are more complicated").*** **(P3)**

"… Mas ganahan ko atong last sir kay murag mafocus ra imong hunahuna, second year, bio ra gyud na tanan murag focus ra gyud nimo. Third year, chemistry". ***("But I preferred the old curriculum since students can focus to the learnings of science topics. For secondary, it is biology and chemistry for third year").*** **(P4)**

"… Sa before nga curriculum, murag nay mastery ang bata nga that whole year murag mao ra na ilang focus". ***(I appreciate the old curriculum since the students learned to master the concepts whole year round and they only focus to certain field like (Biology, Chemistry, Earth Science, and Physics)").*** **(P5)**

Based on the findings above, specialized science teachers in junior high school particularly those who were teaching science subject for a long year find it hard to easily adapt to the spiral progression approach prescribed by the new curriculum, since there is a need for them to teach science concepts whom they are not familiarize or comfortable with. This was supported on the findings of Samala (2018), teachers had the mastery of the subject matter in their own area of specialization because they are very much aware of the lessons. Furthermore, mostly of the interviewed science teachers had a difficulty on science topics that deals on numbers and calculations as a result they skipped such activities and proceed to the next lesson. They agreed that they can teach effectively to science concepts whom they are experts or specialized.

In times that they are about to teach other areas of science, the specialized teachers had to study and even ask the help of their colleagues in order to have enough knowledge on the lesson. They agreed that cooperative learning in teaching science subject is not only appropriate to their students but effective in teaching science to students and even to those fellow teachers. The result was also supported on the study of Resurrecion and Adanza (2015) that in order to cope up with the challenges, science teachers read more books, find resources such as internet, asked their colleagues and collaborate with their fellow teachers who are specialized on certain science concepts during mentoring and coaching sessions.

Conclusion

The study shows that specialized science teachers teaching from the old curriculum were experiencing a hard time implementing the spiral progression approach (SPA) as prescribed under the new K to 12 curriculum. Most of them who are teaching a wide range of science topics in different grade levels observed difficulties and problems during their transition period from one to two years of teaching science using the spiral progression approach.

Moreover, spiral progression approach brought an unexpected advantage to the specialized science teachers whom they learned to become a generalist type whose expertise and skills were not only limited to their major science fields. They eventually learned to adjust and adapt various method of science teaching that differs from what they used to be during the old curriculum. They learned to become resourceful in looking possible solutions and improving their ways of teaching science especially to concepts which are out of their expertise in order to meet the standards and quality of teaching that the curriculum required for them. Cooperative learning was established in the school environment as the science teachers learned to communicate and collaborate with their fellow science teachers and cooperatively shared knowledge and previous learnings such as coaching and mentoring sessions.

However, if given a choice, the five specialized secondary science teachers still preferred the old curriculum since it allows them to teach at least one major science field in a year namely Integrated Science, Biology, Chemistry and Physics rather than the spiraling approach that only limits per quarter in every school year.

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Based on the findings, DepEd curriculum implementers and policy makers must conduct a relevant science training programs and workshops that caters the need of the specialized science teachers in terms of the contents and pedagogy using the spiral progression approach. The Higher Education Institutions (HEIs) offering secondary teacher-education courses should align their curriculum to the DepEd's K to 12 curriculum in order to equip their graduates with the necessary skills who will becoming future teachers in the field and able to teach basic science concepts and skills using the spiral progression approach effectively and efficiently. Future researchers should also conduct a similar study that includes private secondary science teachers as participants to compare their experiences to those who are in public secondary schools.

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