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RESEARCH PAPER

Factorial Analyses of Students' Progress through the K to 12 Science Spira Progression Curriculum

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ABSTRACT

The study delved into the implementation of the science spiral progression curriculum in selected public junior high schools in the Division of Pasig City, Philippines, covering school year 2017-2018 based on the observed factors that influence students' progress relative to the K-12 science spiral progression curriculum. The study hypothesized that there are significant differences in the perspectives of science teachers in executing the science spiral progression curriculum; and that there are significant differences in the way the science teachers handle the science spiral progression curriculum across year levels. The study used the quantitative approach to research, particularly the descriptive research methodology. The specific descriptive research designs utilized were the correlational and normative surveys. The contextual analysis technique was likewise used. Data were statistically tested with the use of frequency distribution formula, percentage formula, percentage weighted mean and one-way ANOVA (analysis of variance.). Based on the findings, the study concluded that the perspectives of the science teachers in executing the science spiral progression curriculum vary from school to school and that there are significant differences in the perspectives of the science teachers in executing the science spiral progression curriculum when compared by school. Also, it was concluded that the science teachers handle the science spiral progression curriculum differently in each school. There are also significant differences in the handling of the science teachers of the science spiral progression curriculum across year levels when compared by school, likewise and majority of the Grade 10 students for School Year 2017-2018 have "fairly satisfactory" performance.

Key words: *Factorial Analyses, Students' Progress, Spiral Progression Curriculum*

INTRODUCTION

The old basic education curriculum mandates Filipino learners to finish their schooling for ten years. The Department of Education, however, in the time of the then president Benigno Simeon C. Aquino III, pushed for the amendments of the old basic education curriculum. They envisioned a 12- year basic education curriculum in addition to Kindergarten, hence, the birth of the K to 12 basic education curriculum.

In the "Discussion Paper on the Enhanced K+12 Basic Education Program" published on October 5, 2010 by the Department of Education, it enumerated the different rationales on why there is a need to shift from a ten-year basic education curriculum to a 12-year basic education curriculum.

The following are the basic principles on why there is a need to shift from the old curriculum to the new twelve year basic education curriculum according to the paper (DepEd, 2010): 1. Enhancing the quality of basic education in the Philippines is urgent and critical; 2. The poor quality of basic education is reflected in the low achievement scores of Filipino students; 3. The old curriculum is congested; 4. The inadequate preparation of high school graduates for the world of work or entrepreneurship or higher education; 5. Most graduates are too young to enter the labor force; 6. Philippine graduates are not automatically recognized as professionals abroad; and 7. The short basic education program affects the human development of the Filipino children.

The implementation of the new K to 12 basic education curriculum in the Philippines started in school year 2012-2013. Prior to this, the Kindergarten Act was implemented in school year 2011-2012 by virtue of Republic Act 10157. With its implementation a paradigm shift in the basic education system had been implemented. One feature that had changed is the structure of the curriculum. In the area of science, especially in the junior high school level, the spiral progression curriculum has been adopted.

This curriculum deviated from the usual practice in which in each grade level, there is a specialized science subject. For instance, 1st year level will take integrated science, 2nd year level will take biology, 3rd year level will take chemistry and 4th year level will take physics. In the case of the new curriculum, the specialized subjects are merged into one level. This means that in each grade level, students will take the four basic science disciplines, namely Earth Science, Biology, Chemistry and Physics in a spiral progression manner. The basic concept of this curriculum is to emphasize the understanding and application of scientific knowledge, learning scientific inquiry skills, and developing and demonstrating scientific attitudes and beliefs (Science Framework for Philippine Basic Education: DOST, 2011).

Spiral progression is an approach that follows the progressive type of curriculum. The approach was anchored from John Dewey's total learning experiences of an individual. Martin, 2008 defined progression as a thing that describes pupils' personal journeys through education and ways, in which they acquire, apply, develop their skills, knowledge and understanding in increasingly challenging situations. Based on this approach, the K to 12 science spiral progression approach was implemented to utilize learner centered approach such as inquiry based learning pedagogy. In the K to 12 Curriculum Guide of Science 2013, it states that the goal of the science curriculum is to produce scientifically literate citizens who are informed and active participants of the society, responsible decision makers, and apply scientific knowledge that will significantly impact the society and the environment.

Literatures suggest that instruction-related factors, teacher competence, in-service training sufficiency, job satisfaction, support from upper management, laboratory adequacy, school resources and assessment tools have influenced teachers and learners in the success of teaching science subjects and that these identified challenges and factors greatly affect the ultimate beneficiaries of education, the learner. With these imminent factors and challenges and to realize the goals of the new science curriculum, many innovations have been introduced. One of the most important is the decongestion of the competencies and arrangement in spiral progression manner. In terms of pedagogical aspect, science instruction shifts from traditional methods to more modern innovative teachings that explore the enhancement of students' critical thinking and scientific skills.

Since the curriculum is a paradigm shift to the usual curriculum not only in science but the K to 12 curriculum as a whole, issues have been raised in its effectiveness on the first years that it was implemented. Burilia, 2012 wrote that, concerns have been raised in the communities where poverty is prevalent that the K to 12 curriculum will not be viable because of some concerns such as availability of technology, teachers training, and even salary of the workforce.

Since its implementation last School Year 2012-2013, the first batch of graduates will walk on the stage on 2018. Hence, this is the best time to evaluate the effectiveness of the curriculum. Did the curriculum really help in making our graduates better? Did our teachers make the best out of the new curriculum to teach their students?

With all of these, the proponent was motivated to do this research in order to identify the different factors that influence students' progress in terms of the new curriculum specifically on the science spiral progression curriculum. In which one of its major focus also is the way teachers handle the said curriculum revolving on factors like, students' learning style, students' study habits, students' motivation to learn, teachers' specialization, teachers' training, teachers' teaching style, school facilities, learning materials and school's support to teacher training.

STATEMENT OF THE PROBLEM

The purpose of the research was to look into the implementation of the spiral curriculum in science in the selected public junior high schools in the Division of Pasig City, Philippines during school year 2017-2018 based on the observed factors that influence students' learning outcomes.

Specifically, the study sought to find answers to the following research problems:

1. What is the perspective of the science teachers when executing the science spiral progression curriculum?
2. What are the differences in the perspectives of the science teachers in executing the science spiral progression curriculum when compared by school?
3. How is the progression handled by the science teachers in the selected junior public high schools across year levels?
4. What are the differences in the handling of the science spiral progression curriculum across year levels when compared by school?
5. What is the progress of the students as measured by their grade 10 individual grade average in science for school year 2017 - 2018?
6. What are the factors that may influence students' progress in the science spiral progression curriculum:
   6.1 Student Factor
      a. Learning Style
      b. Study Habits
      c. Motivation to Learn;
   6.2 Teacher Factor
      a. Teacher's Specialization
      b. Teacher Training
      c. Teaching Style
   6.3 School Factor
      a. School Facilities
      b. Learning Materials
      c. Support to Teacher Training

THEORETICAL FRAMEWORK

The study is based on three theoretical lenses, namely: constructivism, progressivism and reconstructionism.

Constructivism, a theory credited to Jerome Bruner is basically a theory based on observation and scientific study about how people learn. It says that people construct their own understanding and knowledge of the world, through experiencing things and reflecting on those experiences. When we encounter something new, we have to reconcile it with our previous ideas and experience, maybe changing what we believe, or maybe discarding the new information as irrelevant. In any case, we are active creators of our own knowledge (https://www.thirteen.org/edonline/concept2class/, 5/16/2018).

The K to 12 curriculum as a curriculum embraces the idea of constructivism. In her column at Sun Star Pampanga, Datu (2016) pointed out that the K to 12 uses spiral progression, that is, as the learning progresses, more and more details are introduced. She added that the concepts are taught early then re-taught in succeeding years with increased sophistication and complexity. Therefore, learners continuously reflect on their experiences while developing the needed abilities and skills to achieve learning. She also said that constructivism encourages different activities where students can reflect, discuss with their teachers or with their peers their outcomes, understand it and learn it.

John Dewey's progressivism on the other hand talks about individuality, progress, and change as fundamental aspects to one's education. Progressivist believed that people learn best from what they consider most relevant to their lives, progressivists center their curricula on the needs, experiences, interests, and abilities of students. Progressivist teachers try making school interesting and useful by planning lessons that provoke curiosity. In a progressivist school, students are actively learning. The students interact with one another and develop social qualities such as cooperation and tolerance for different points of view. In addition, students solve problems in the classroom similar to those they will encounter in their everyday lives. Progressivists believe that education should be a process of ongoing growth, not just a preparation for becoming an adult (https://www.siue.edu/~ptheodo/foundations/progressivism, 5/16/2018).

In the K to 12 curriculum, Datu (2016) said that the curriculum aims to develop learners who are armed with sufficient competencies which could be achieved by actively applying and utilizing it in real world, actively testing ideas or concepts learned. She added that progressivism in the current K to 12 curriculum is applied because students are to experience the world; it is therefore active not passive in its nature.

Lastly, Theodore Brameld's reconstructionism is a philosophy that emphasizes the addressing of social questions and a quest to create a better society and worldwide democracy. Reconstructionist educators focus on a curriculum that highlights social reforms as the aim of education (https://oregonstate.edu/instruct/ed416/PP3.html, 5/16/2018).

On the current K to 12 curriculum, Datu (2016) said that its goals highlights on social reform, from a 10 year basic education to a 12 year plan. She added that the traditional understanding that a 10–year basic education is sufficient has been changed to improve human conditions. Also, k to 12 curriculums allows the students to experience and take social action on real problems. Community based learning and bringing the world into the classroom are strategies used.

CONCEPTUAL FRAMEWORK

The conceptual framework of this research was rooted from the theoretical framework and related literature reviewed in this study. The conceptual framework as shown in this study illustrates the processes that were undertaken in the conduct of this study. The framework explains that there is great deal of connection between the science teachers and the students. This connection is signified and carried out in the execution of the science spiral progression curriculum.

In the execution of the curriculum the teacher and the students will encounter factors that can affect students' progress. The factors that could influence these outcomes may come from the teacher themselves, the students and the schools. To facilitate and to take advantage of these factors, a thorough study should be done in order to facilitate which of the factors that influence students' progress the most.

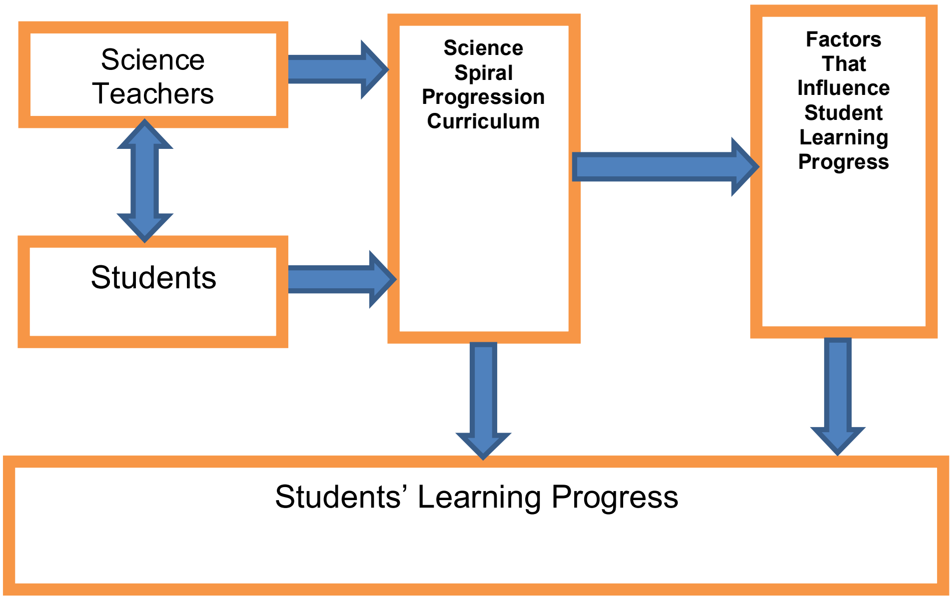

Fig. 1: Conceptual Model

RESEARCH METHODS AND DESIGNS

This research used the quantitative approach as it delved with numerical data relative to the subject of the investigation. Hunter and Leahey (2008) defined quantitative research as the systematic empirical investigation of social phenomena via statistical, mathematical or computational techniques. The specific research methodology utilized was the descriptive research. This type of research involves either identifying characteristics of an observed phenomenon or exploring possible correlations among two or more phenomena. In every case, descriptive research examines a situation as it is (Leedy & Ormrod, 2014).

In this research, the descriptive delves into situations or conditions about the K to 12 science spiral progression curriculum through its normative survey design and correlational design and contextual analysis techniques. The normative survey design describes and interprets "what is" and reveals conditions that exist, practices that prevail or do not prevail, and in attitudes that are held on or not (Estolas & Macaballug, 1995). This design was used in this study to generate data on the perceptions of teachers on their execution of the science spiral progression curriculum, on how they handle the progression on factors that influence students' learning outcomes in the spiral progression curriculum and on how they describe themselves in selected personal characteristics.

The correlational design of descriptive research was likewise used to determine the influence of student, teacher and school factors on students' learning outcomes in the science spiral progression curriculum. Correlational design examines the extent to which differences in one characteristic or variable are related to differences in one or more other characteristics or variables. A correlation exists if, when one variable increases the other variable either increases or decreases in a somewhat predictable fashion (Leedy & Ormrod, 2014).

The study also used the content analysis technique to collect data on individual Grade 10 average of a total of 8,513 students from the selected public junior high schools in Pasig City. The existing documents used provided data on the progress of students during school year 2017-2018. This technique was used in this study because the researcher analysed the Grade 10 students' individual average taken from the grading sheets of the teachers and the report cards of the students.

STUDY POPULATION AND SAMPLING SCHEME

A total of 195 science teachers were asked to answer the survey questionnaire. The purposive sampling was used to intentionally select individuals and sites to learn and understand the central phenomenon (Cresswell, 2012). The same sampling scheme and standard were applied to the selection of the ten public junior high schools of the Division of Pasig City in the National Capital Region. The ten school participants represented 83.33 percent of the 12 public junior high schools in the Division of Pasig City.

The science teachers who participated provided the necessary information required by the study. They were considered as "information rich". More than 50.0 percent of the grade 10 students from each school were likewise purposively selected to elicit information on the progress of the students in the science spiral progression curriculum. Their science grade averages based on Report Cards and Grading Sheets were used in the study. The sample for each group was very adequate as shown by the sample percentages of more than 50.0 percent for each study population.

INSTRUMENT USED

The modified instrument used in this research has four major parts. Part I elicited the personal information of the respondents in terms of school, sex, age, educational attainment and area of specification. It must be noted however that these profiles were not used in the inferential part of the research, hence not included in the statement of the problem; they were included to describe the respondents. Part II was concerned with the perspective of the public junior high school science teachers in executing the science spiral progression curriculum. Part III dealt with the level of agreement of the public junior high school science teachers as to how they handled the students using the spiral progression curriculum across year levels. Lastly, part IV of the instrument gathered information on the factors that influence students' learning outcomes in the spiral progression curriculum in terms of student factor, teacher factor and school factor.

For part II and III of the instrument, the researcher used a researcher made instrument which was validated by experts. These experts were professors of Rizal Technological University and Master Teachers and Head Teacher of Nagpayong High School. Part IV of the instrument made use of a standardized instrument, the "A Manual for the Use of the Motivated Strategies for Learning Questionnaires" by Paul R. Pintrich, David A.F. Smith, Teresa Garcia and Wilbert J. McKeachie which was published by "The Regents of the University of Michigan" in 1991. The behaviors measured by the instrument are the students' learning style, study habits, students' motivation to learn and teachers' teaching style. The arbitrary ratings of the instrument are as follow:

Scale Value	Verbal Interpretation
3.26 – 4.00	Strongly Agree (SA)
2.51 – 3.25	Agree (A)
1.76 – 2.50	Disagree (DA)
1.00 – 1.75	Strongly Disagree (SDA)

The report cards and the grading sheets were used to get the grade averages of the student respondents. The researcher compared the report cards with the grading sheets to check the accuracy of data. The description, grading scale and remarks of the grades are shown in the table below.

Table 1: Description, Grading Scale and Remarks of the Grades

Description	Grading Scale	Remarks
Outstanding	90-100	Passed
Very Satisfactory	85-89	Passed
Satisfactory	80-84	Passed
Fairly Satisfactory	75-79	Passed
Did Not Meet Expectations	74 – below	Failed

Reference: Department of Education Order No. 8 Series of 2015, “Policy Guidelines on Classroom Assessment for the K to 12 Basic Education Program.

Parts I, II and III of the survey questionnaire had undergone a validation process. The validation process includes judgments by experts and pilot testing or dry run. The draft of the instrument was shown to the experts and to the dissertation adviser for comments and suggestions. Comments and suggestions were then incorporated in the final draft of the instrument. To strengthen the content validity of the instrument, a dry run was conducted to 15 selected science teachers in Pasig City. The final draft of the instrument was approved by the dissertation adviser for administration to the respondents of the research. Since part IV of the instrument made use of a standardized instrument, no validation process was done.

RESULTS AND DISCUSSIONS

1. Perspective of the Science Teachers when Executing the Science Spiral Progression Curriculum

Based on the findings, the overall weighted mean for all the selected public junior high school in terms of their perspective when executing the science spiral progression curriculum is 2.84 with a verbal interpretation of “agree”. With an overall weighted mean of 2.66 the science teachers agree that they have less likelihood to agree that they are given enough time to discuss the different topics in a school year while with an overall weighted mean of 3.23, the science teachers have generally agreed that they have a good understanding on the content of the science spiral progression curriculum in terms of the knowledge, skills and attitudes that my students should learn) got the highest.

These perspectives of the science teachers coincide with what Snider (2004) supposed that the spiral Progression approach has advantages and disadvantages. He said that the spiral Progression approach avoids disjunctions between stages of schooling; it allows learners to learn topics and skills appropriate to their developmental/cognitive stages, and it strengthens retention & mastery of topics & skills as they are revisited & consolidated but the problem with the spiral design is that the rate for introducing new concepts is often either too fast or too slow. Similarly, Cobern (2014) stated that a critical aspect of teacher education is gaining pedagogical content knowledge of how to teach science for conceptual understanding. Also, understanding of the curriculum is a teacher’s responsibility as Crawford (2000) expressed that in teaching science, especially in an inquiry-based classroom, teachers assume the roles of a motivator, diagnostician, guide, innovator, experimenter, researcher, modeler, mentor, collaborator, as well as a learner.

Table 2: Weighted Means of the Perspectives of Science Teachers in Executing the Science Curriculum

Items	Overall Mean	
	Weighted Mean	Verbal Interpretation
1. I have a good understanding on the content of the science spiral progression curriculum in terms of the knowledge, skills and attitudes that my students should learn.	**3.23**	**AGREE**
2. I have a positive attitude towards the implementation of the science spiral progression curriculum.	**3.19**	**AGREE**
3. I'm provided with plenty of resource materials in the execution of the science spiral progression curriculum.	**2.65**	**AGREE**
4. I have the opportunities to receive recent or up to date curriculum professional support.	**2.83**	**AGREE**
5. I have a sound knowledge of strategies known to be effective for the teaching of the new science spiral progression curriculum.	**3.08**	**AGREE**
6. I'm not reluctant to execute the science spiral progression curriculum even though some of the topics included in the curriculum are not my area of specialization.	**3.02**	**AGREE**
7. I'm given enough time to discuss the different topics in a school year.	**2.66**	**AGREE**
8. I'm provided with a sound understanding of the alternative ways of teaching the science spiral progression curriculum in order for the students to understand better the scientific ideas included in the curriculum.	**2.93**	**AGREE**
9. I have a strong motivation to ensure that the topics in the science spiral progression are taught clearly in my school.	**3.06**	**AGREE**
10. I have a strong conviction that the science spiral progression curriculum is a solid curriculum in bridging the gap of the former congested science curriculum.	**2.70**	**AGREE**
11. I have the personal confidence and necessary skills to execute the science spiral progression curriculum competently.	**3.00**	**AGREE**
12. I'm provided with opportunity to undertake professional development to enhance my knowledge in executing the science spiral progression curriculum.	**2.80**	**AGREE**
13. I have the confidence that contents in the science spiral progression curriculum are well organized.	**2.72**	**AGREE**
14. I'm supported by the administration in your efforts to execute the science spiral progression curriculum.	**2.84**	**AGREE**
15. I'm provided with necessary equipment to teach the science spiral progression curriculum.	**2.73**	**AGREE**
OVERALL	**2.84**	**AGREE**

2. Differences in the Perspectives of the Science Teachers in Executing the Science Spiral Progression Curriculum when Compared by School.

With an overall p- value of .003 for all the items, findings showed therefore there are significant differences in terms of the perspective of the science teachers in executing the science spiral progression curriculum at alpha .05.

This means that the science teachers in the Division of Pasig City, Philippines still has a lot of variances in terms of their outlooks towards the science spiral progression curriculum. This might be because the science spiral progression curriculum is just in its maiden implementation, as Padolina (2016), pointed out that having the K-12 system in place does not exactly mean that there is no more room for improvement. He further acknowledges that there is still work that needs to be done in addressing the challenges in implementation and in improving the system and the curriculum itself

Table 3: Differences in the Perspectives of Science Teachers in Executing the Science Spiral Progression Curriculum

ITEMS	f - value	p - value	Interpretation
1. I have a good understanding on the content of the science spiral progression curriculum in terms of the knowledge, skills and attitudes that my students should learn.	1.749	.084	**Not Significant**
2. I have a positive attitude towards the implementation of the science spiral progression curriculum.	3.439	.001	**Significant**
3. I'm provided with plenty of resource materials in the execution of the science spiral progression curriculum.	2.877	.004	**Significant**
4. I have the opportunities to receive recent or up to date curriculum professional support.	1.600	.122	**Not Significant**
5. I have a sound knowledge of strategies known to be effective for the teaching of the new science spiral progression curriculum.	.968	.470	**Not Significant**
6. I'm not reluctant to execute the science spiral progression curriculum even though some of the topics included in the curriculum are not my area of specialization.	1.491	.158	**Not Significant**
7. I'm given enough time to discuss the different topics in a school year.	5.132	.000	**Significant**
8. I'm provided with a sound understanding of the alternative ways of teaching the science spiral progression curriculum in order for the students to understand better the scientific ideas included in the curriculum.	1.974	.047	**Significant**
9. I have a strong motivation to ensure that the topics in the science spiral progression are taught clearly in my school.	2.455	.013	**Significant**
10. I have a strong conviction that the science spiral progression curriculum is a solid curriculum in bridging the gap of the former congested science curriculum.	3.216	.001	**Significant**
11. I have the personal confidence and necessary skills to execute the science spiral progression curriculum competently.	2.094	.034	**Significant**
12. I'm provided with opportunity to undertake professional development to enhance my knowledge in executing the science spiral progression curriculum.	2.962	.003	**Significant**
13. I have the confidence that contents in the science spiral progression curriculum are well organized.	1.648	.108	**Not Significant**
14. I'm supported by the administration in your efforts to execute the science spiral progression curriculum.	2.045	.039	**Significant**
15. I'm provided with necessary equipment to teach the science spiral progression curriculum.	2.479	.012	**Significant**
OVERALL	**2.965**	**.003**	**Significant**

3. The Progression as Handled by the Science Teachers in the Selected Junior Public High Schools across Year Levels.

The findings show that the overall weighted mean for all the selected public junior high school in terms of how they handled the progression across year level was 3.00 with a verbal interpretation of "agree". With an overall weighted mean of 2.67 (agree), the science teachers were less likely to agree that they matched the materials and strategies needed in teaching the different concepts as the topics progress, while with an overall weighted mean of 3.16 (agree), they have greater agreement that they create students' authentic tasks to evaluate their students.

This means that majority of the teacher respondents are more likely to agree that in handling the science spiral progression curriculum, authentic tasks should be made as one of the evaluation methods, as Datu (2016) said that the K to 12 curriculum aims to develop learners who are armed with sufficient competencies which could be achieved by actively applying and utilizing it in real world, actively testing ideas or concepts learned, thus, the use of authentic tasks in evaluating students' performance relative to the K to 12 curriculum is a great method. Equally, Zulueta as cited by Adanza and Resurrection, (2002) stated that the spiral Progression refers to the choosing and defining of the content of a certain discipline to be taught using prevalent ideas against the traditional practice of determining content by isolated topics. Given these descriptions, spiral curriculum can be understood as a design, a written plan, list of subjects and expected outcomes of the students in which one concept are presented repeatedly throughout the curriculum, but with deepening layers of complexity. Martin as cited by Adanza and Resurrection (2008) also emphasized that the spiral curriculum is a design framework which will help science teachers construct lessons, activities or projects that target the development of thinking skills and dispositions which do not stop at identification.

Table 4: Weighted Means of Science Teachers in Handling Spiral Progression Across Year Levels

Items	Overall Mean	
	Weighted Mean	**Verbal Interpretation**
1. Identify clearly the purpose of each topic as each topic in curriculum progresses.	**3.08**	**AGREE**
2. Fulfill the educational purposes in each topic.	**2.99**	**AGREE**
3. Matched the materials and strategies needed in teaching the different concepts as the topics progress.	**2.67**	**AGREE**
4. Set the pace of learning as the topics become more difficult.	**2.75**	**AGREE**
5. Choose the best among the different alternative courses of strategies in teaching the progression.	**2.94**	**AGREE**
6. Search and explore other courses of information in teaching the progression.	**2.97**	**AGREE**
7. Craft my own information materials in teaching the progression.	**3.05**	**AGREE**
8. Create students' authentic tasks to evaluate my students.	**3.16**	**AGREE**
9. Provide experimental activities in the different topics in teaching the progression.	**2.93**	**AGREE**
10. Collaborate with peers in concepts that are hard to understand in teaching the progression.	**3.12**	**AGREE**
11. Design projects or requirements related to the different topics in the progression.	**3.15**	**AGREE**
12. Use proper evaluation criteria as the progression changes from one quarter to another.	**3.13**	**AGREE**
13. Develop quality lesson plans on the different topics in the progression.	**3.02**	**AGREE**
14. Ask and receive professional support from the subject area experts.	**2.99**	**AGREE**
15. Ask and receive technical and pedagogical support from my colleagues.	**3.06**	**AGREE**
OVERALL	**3.00**	**AGREE**

4. Differences in Handling the Science Spiral Progression Curriculum by the Science Teachers across Year Levels.

Table 5: Differences in Handling the Science Spiral Progression Curriculum by the Science Teachers across Year Levels

ITEMS	f - value	p - value	Interpretation
1. Identify clearly the purpose of each topic as each topic in curriculum progresses.	1.418	.187	**Not Significant**
2. Fulfill the educational purposes in each topic.	1.542	.140	**Not Significant**
3. Matched the materials and strategies needed in teaching the different concepts as the topics progresses.	1.257	.267	**Not Significant**
4. Set the pace of learning as the topics become more difficult.	1.682	.099	**Not Significant**
5. Choose the best among the different alternative courses of strategies in teaching the progression.	1.320	.232	**Not Significant**
6. Search and explore other courses of information in teaching the progression.	1.416	.188	**Not Significant**
7. Craft my own information materials in teaching the progression.	2.328	.018	**Significant**
8. Create students' authentic tasks to evaluate my students.	2.075	.036	**Significant**
9. Provide experimental activities in the different topics in teaching the progression.	2.191	.027	**Significant**
10. Collaborate with peers in concepts that are hard to understand in teaching the progression.	2.167	.028	**Significant**
11. Design projects or requirements related to the different topics in the progression.	2.877	.004	**Significant**
12. Use proper evaluation criteria as the progression changes from one quarter to another.	2.083	.035	**Significant**
13. Develop quality lesson plans on the different topics in the progression.	1.781	.078	**Not Significant**
14. Ask and receive professional support from the subject area experts.	2.155	.029	**Significant**
15. Ask and receive technical and pedagogical support from my colleagues.	2.490	.012	**Significant**
OVERALL	**2.453**	**.013**	**Significant**

With an overall p- value of .013 for all the items, findings showed therefore that there are significant differences in terms of how the teachers handled the science spiral progression curriculum across year levels at alpha .05.

This means that the level of knowledge of the science teachers in terms of the different disciplines in science varies, which is why they handle the students differently across year levels. In the same way, Samala (2017) in her study found out that science teachers agree that both vertical and horizontal articulation of the spiral Progression approach were hard to trace in the learning competencies. Moreover, according to her, based on the data she gathered, teachers pointed out that the vertical articulation was hard to trace in all the areas of science, for the reason that the students tended to forget what they have learned from the previous grade level, furthermore, the science teachers said in her study that the vertical articulation was hard to trace in other areas of science because it is not their area of specialization.

5. Progress of the Students as Measured by their Grade 10 Individual Grade Average in Science for School Year 2017-2018.

Table 6: Overall Students' Progress in Science of the Different Schools

GRADES	FREQUENCY (F)	PERCENTAGE (%)	GRADE DESCRIPTION
90 – 100	928	10.9	**Outstanding**
85 – 89	1715	20.1	**Very Satisfactory**
80 – 84	2406	28.3	**Satisfactory**
75 – 79	3150	37.0	**Fairly Satisfactory**
74 and below	314	3.7	**Did Not Meet Expectation**
TOTAL	**8513**	**100.0**	

The findings show that 37.0% (3150 student respondents) of the grade 10 students have "fairly satisfactory" performance, followed by "satisfactory" (28.3%, 2406 student respondents), then "very satisfactory" (20.1%, 1715 student respondents), "outstanding" (10.9%, 928 student respondents) and lastly "did not meet expectation" with 3.7% (314 student respondents).

Results revealed in the data imply that there were still a lesser number of students who have "outstanding" performance and "very satisfactory" performance compared to the total number of students who have performances classified as "satisfactory", "fairly satisfactory" and "did not meet expectation". This suggests that the result still conforms to the findings of the Department of Education (DepEd) and Commission on Higher Education (CHED) together with some representatives from private sectors who made an evaluation study on evaluation of basic education program of the country and found out that the country's basic mathematics and science education is at alarming stage (Lumaque, Sarraga & Jumawan, 2004-2005). Also, based on the United Nations Development Report 2009, Philippines is among the countries in the world with higher literacy rate at 93.4 percent in 2008 but the performance of Filipino students in international Mathematics and Science tests stuck at the bottom while struggling at a passing level locally.

With its maiden implementation, fixed results have yet to come if the new K to 12 curriculum will help improve science performance of Filipino students. In the K to 12 Curriculum Guide of Science 2013, it states that the goal of the science curriculum is to produce scientifically literate citizens who are informed and active participants of the society, responsible decision makers, and apply scientific knowledge that will significantly impact the society and the environment.

6. Factors that Influence Students' Progress in the Science Spiral Progression Curriculum.

STUDENT FACTOR:

Student Factor as to Learning Styles:

Based on the findings, the overall weighted mean for all the selected public junior high school in terms of student factor as to learning styles was 2.94 with a verbal interpretation of "agree". Individually, Santolan High School (SHS) got a weighted mean of 2.74 (agree), Nagpayong High School (NHS) got 3.27 (strongly agree), Manggahan High School (MHS) got 3.23 (agree), Sta. Lucia High School (SLHS) got 2.86 (agree), Pinagbuhatan High School (PHS) got 2.82 (agree), Rizal high School (RHS) got 2.99 (agree), Rizal Experimental Station and Pilot School of Cottage Industries (RESPCI) got 2.98 (agree), San Joaquin Kalawaan High School (SJHS) got 3.77 (strongly agree), Eusebio High School (EHS) got 2.74 (agree), and Sagad High School (SGHS) got 2.99 (agree). With an overall weighted mean of 2.82 (agree) item 3 (students to make list of important terms for the course and memorize the lists) got the lowest, while with an overall weighted mean of 3.04 (agree), item 6 (students to make simple charts, diagrams, or tables to help them organize course materials got the highest.

This conforms to what the Common Core State Standards (CCSS ELA) believed, that English and language arts teachers share the responsibility with other educators for teaching students to understand “informational text,” including science material found in books, magazines, and newspapers and on the web (NGAC and CCSSO 2010). They added that like a picture, a graph can be worth a thousand words. However, almost all students need teachers’ help, over a period of years, to read graphs well. In that sense, graph literacy is like learning to read graphs well. In that sense, graph literacy is like learning to read text; each requires repeated practice and a focus on greater complexity as students develop their skills.

Table 7: Weighted Means of the Factors Affecting Students’ Progress as to Learning Styles

STUDENT FACTOR: LEARNING STYLES	OVERALL	
Items	**WEIGHTED MEAN**	**VERBAL INTERPRETATION**
1. Students to read their notes and the course reading over and over again.	2.84	AGREE
2. Students to memorize key words to remind them of important concepts in the class.	2.91	AGREE
3. Students to make list of important terms for the course and memorize the lists.	2.82	AGREE
4. Students to pull together information from different sources, such as lectures, readings, and discussions.	2.92	AGREE
5. Students to write brief summaries of the main ideas from readings and the concepts from the lectures.	2.93	AGREE
6. Students to make simple charts, diagrams, or tables to help them organize course materials.	3.04	AGREE
7. Students to find themselves questioning things that they hear or read in the subject to decide if they find it convincing.	3.00	AGREE
8. Students to play around with ideas of their own related to what they are learning in the subject.	3.00	AGREE
9. Students to apply ideas from course readings in other class activities such as lecture and discussion.	3.02	AGREE
10. Students to study the subject in a way that they try to go over their class notes and make an outline of important concepts.	2.91	AGREE
OVERALL	2.94	AGREE

Student Factor as to Study Habits:

The table displays that generally the science teachers “agree” with an overall weighted mean of 2.95 on the items presented to them in the questionnaire in terms of the factors that affect students’ progress as to study habits. With a weighted mean of 3.09, item 2 got the highest; it denotes that participating proactively during group work affect students’ progress relative to the execution of the spiral Progression curriculum. With progressivism as one of the basic theories encapsulated in the K to 12 curriculum, thus, group work or practical works would really help students to learn science. As Johnson, Johnson and Holubec (2014) conveyed that many teachers from disciplines across the academe use group work to enhance their students’ learning. Whether the goal is to increase student understanding of content, to build particular transferable skills, or some combination of the two, instructors often turn to small group work to capitalize on the benefits of peer-to-peer instruction. Accordingly, David Johnson, Roger Johnson, and Karl Smith performed a meta-analysis of 168 studies comparing cooperative learning to competitive learning and individualistic learning in college students (Johnson, Johnson and Smith, 2006) and they found that cooperative learning produced greater academic achievement than both competitive learning and individualistic learning across the studies.

Item 3 which deals on students doing their assignment got the lowest weighted mean with 2.80. This means that there is a lesser likelihood that the science teachers "agree" that assignments could be a factor that affects students' progress. This conforms also to the Department of Education's memorandum encouraging teachers to lessen the assignments given to students, which according to Cooper, Robinson and Patall (2006), that while assigning homework may have academic benefits, it can also cut into important personal and family time. Accordingly, Fernandez, Suarez and Muniz (2015) in their research revealed that assigning too much homework can result in poor performance. On a lighter note, Darling-Hammond & Ifill-Lynch (2006) stated that the goal shouldn't be to eliminate homework, but to make it authentic, meaningful, and engaging.

Table 8: Weighted Means of the Factors Affecting Students' Progress as to Study Habits

STUDENT FACTOR: STUDY HABITS	OVERALL	
Items	**WEIGHTED MEAN**	**VERBAL INTERPRETATION**
1. Students to read books other than the textbooks.	**2.84**	**AGREE**
2. Students to proactively participate during group work.	**3.09**	**AGREE**
3. Students to do their assignments diligently.	**2.80**	**AGREE**
4. Students to break down major concepts into smaller concepts.	**2.89**	**AGREE**
5. Students to learn better when given more complicated examples.	**2.92**	**AGREE**
6. Students to take notes during classes.	**3.01**	**AGREE**
7. Students to study by following strictly the teachers' instructions.	**2.93**	**AGREE**
8. Students to memorize the concepts as much as possible.	**2.94**	**AGREE**
9. Students to ask questions.	**3.06**	**AGREE**
10. Students to use different methods from what they learned at school to solve problems.	**3.01**	**AGREE**
OVERALL	**2.95**	**AGREE**

Student Factor as to Students' Motivation to Learn:

The table exhibits that generally the science teachers "agree" with an overall weighted mean of 3.14 on the items presented to them in the questionnaire in terms of the factors that affect students' progress as to motivation to learn.

Item 10 which talks about making students feel confident that they understand the most complex material presented by the teacher of the subject got the highest weighted mean of 3.19. This implies that a because of the complexity of topics in the progression as it progressed, teachers must have the ability to motivate students to making them believe that they can still understand the lessons presented to them. As Delong and Dale (2002) indicated that intrinsic motivation can be long-lasting and self-sustaining. Efforts to build this kind of motivation are also typically efforts at promoting student learning. Such efforts often focus on the subject rather than rewards or punishments.

With a lowest weighted mean of 3.09, there is much less possibility that the science teacher "agree" on item 3, which talks about making students realize that getting good grades in the subject is the most satisfying thing. However, Kumar, Gheen, and Kaplan (2002) argue that performance goals can potentially lead to academic struggle. Similarly, Midgley (2002) points out that the promotion of mastery goals over the school years decreases that the learning process and quality of learning are at risk when grades are used as a motivating force.

Table 9: Weighted Means of the Factors Affecting Students' Progress as to Motivation to Learn

STUDENT FACTOR: MOTIVATION TO LEARN	OVERALL	
Items	WEIGHTED MEAN	VERBAL INTERPRETATION
1. Use course materials that really challenge the students so that they can learn new things.	3.13	AGREE
2. Make students think that what they will learn in the subject could be used to understand other subjects.	3.17	AGREE
3. Make students realize that getting good grades in the subject is the most satisfying thing for them.	3.09	AGREE
4. Let students be confident that they can learn the basic concepts taught in the course.	3.11	AGREE
5. Use course material that can arouse their curiosity, even if the subject is difficult to learn.	3.13	AGREE
6. Make Students realize that the most satisfying thing for the students is to try to understand the content of the subject as thoroughly as possible.	3.13	AGREE
7. Encourage students that they can master the skills being taught in the subject.	3.16	AGREE
8. Make students participate in class because it is important for them to show their abilities, to their families, friends and others.	3.14	AGREE
9. Make students think that the course materials in the subject are useful for them to learn.	3.17	AGREE
10. Make the students feel confident that they can understand the most complex material presented by the teacher of the subject.	3.19	AGREE
OVERALL	3.14	AGREE

TEACHER FACTOR:

Teacher Factor as to Teachers' Specialization:

The Table shows that largely the science teachers "agree" with an overall weighted mean of 3.09 on the items presented to them in the questionnaire in terms of the factors that affect students' progress as to teachers' specialization.

With a weighted mean of 3.21 item 1 got the highest. The statement focuses on the difficulty of teachers in preparing students for examination. This may be due to more sophisticated process of assessment processes under the K to 12 curriculum as assessment in the K-12 curriculum is also standards-based as it seeks to ensure that teachers will teach to the standards. The students' attainment of standards in terms of content and performance is, therefore, a critical evidence of learning (DepEd Order No. 31, 2012). Tordecillas (2014) as cited by Orbe, Espinoza and Datukan (2018) reported that K-12 teachers should understand the standards-based assessment and all other terminologies connected to it. Further, they have to have a positive view of it. However, understanding the concept and having a positive perception of it do not guarantee teachers' ease where construction of the assessment is concerned. Items 6 and 10 got the lowest weighted mean of 3.01. This implies that the science teacher respondents less likely to "agree" that they have difficulty in creating rubric that can be used effectively to assess the students and keeping students on task in the classroom and sparking their imaginations.

This implies that science teachers are good in making rubrics to effectively assess their students. This might be due to the fact that even prior to the implementation of the K to 12 science spiral progression curriculum, they are already used to using rubrics as a way to assess their students. According to Glickman-Bond and Rose, 2006, apart from being considered as an 'effective' tool for measuring, evaluating and reporting student achievement, rubrics are also 'designed' to guide students' learning, teachers' instruction, course development and administrators' program observations. Rubrics therefore are held as being direct assessment measures which help to answer the key questions driving outcomes assessment, i.e. "how students learn; what students learn; how is student learning assessed; and how are assessment results used" (Glenn, 2005).

Table 10: Weighted Means of the Factors Affecting Students' Progress as to Teachers' Specialization

TEACHER FACTOR: TEACHERS' SPECIALIZATION	OVERALL	
Items	**WEIGHTED MEAN**	**VERBAL INTERPRETATION**
1. Preparing students for examinations.	**3.21**	**AGREE**
2. Giving students a positive outlook of the content that I'm teaching.	**3.10**	**AGREE**
3. Choosing the right or appropriate outside readings and materials.	**3.08**	**AGREE**
4. Changing the mindset of the learners to jump to the next topic.	**3.04**	**AGREE**
5. Changing the nature of the concept of the topic at hand based on recent discoveries or recent developments in science.	**3.07**	**AGREE**
6. In creating a rubric that can be used effectively to assess the students.	**3.01**	**AGREE**
7. Managing the time devoted in a particular topic.	**3.20**	**AGREE**
8. Tailoring class plans, activities and scientific language for students to understand me better.	**3.16**	**AGREE**
9. Motivating myself to teach the topic.	**3.06**	**AGREE**
10. Keeping students on task in the classroom and sparking their imaginations.	**3.01**	**AGREE**
OVERALL	**3.09**	**AGREE**

Teacher Factor as to Support to Teacher Training:

Table 11: Weighted Means of the Factors Affecting Students' Progress as to Teachers' Training

TEACHER FACTOR: TEACHER TRAINING	OVERALL	
Items	**WEIGHTED MEAN**	**VERBAL INTERPRETATION**
1. Adequate and serious in service trainings on the curriculum.	**3.07**	**AGREE**
2. Equal available professional development opportunities.	**3.07**	**AGREE**
3. Available scholarship grants for continuing education.	**2.85**	**AGREE**
4. Quarterly in house professional development in the school.	**2.97**	**AGREE**
5. Faculty mentoring program for the out of field subjects being taught in the curriculum.	**3.10**	**AGREE**
OVERALL	**3.01**	**AGREE**

Above Table shows that essentially the science teachers “agree” with an overall weighted mean of 3.01 on the items presented to them in the questionnaire in terms of the factors that affect students’ progress as to teachers’ training. Item 5 got the highest weighted mean of 3.10. Science teacher respondents are more likely to “agree” that the new science curriculum demands them to have a faculty mentoring program for the out of field subjects being taught by them in the curriculum. This might be because of the fact that in the case of the new curriculum, the specialized subjects are merged into one level. This means that in each grade level, students will take the four basic science disciplines, namely Earth Science, Biology, Chemistry and Physics in a spiral Progression manner. This implies that science teachers will now teach the four basic disciplines even though it’s not their area of specialization. Science teachers cannot escape this new challenge because the basic concept of this curriculum is to emphasize the understanding and application of scientific knowledge, learning scientific inquiry skills, and developing and demonstrating scientific attitudes and beliefs (Science Framework for Philippine Basic Education: DOST, 2011).
With the lowest weighted mean of 2.85 is item 3, this implies that that there is a much lesser possibility that the science teacher will “agree” that the curriculum demands them to have available scholarship grants for continuing education. Witnessing the latest trend in continuing education, teachers now are aware of the importance of getting a higher degree whether it is for professional and personal growth or for promotion. It is now an initiative coming from the teachers because of the stiff competition in academic world, thus, they now go to graduate schools with or without a scholarship program.

Teacher Factor as to Teaching Styles:

Table 12: Weighted Means of the Factors Affecting Students’ Progress as to Teaching Styles

TEACHER FACTOR: TEACHING STYLES	OVERALL	
Items	WEIGHTED MEAN	VERBAL INTERPRETATION
1. Communicate clearly with your students.	3.20	AGREE
2. Use science materials that are easy to understand.	3.16	AGREE
3. Present the lesson in a variety of ways.	3.15	AGREE
4. Give feedbacks to students about what should be done from time to time.	3.13	AGREE
5. Adapt learning experiences to the learners according to their developmental level.	3.12	AGREE
6. Maintain eye contact to all corners of the room.	3.15	AGREE
7. Adopt a reasonable and adjustable pace that balances content coverage and student understanding.	3.20	AGREE
8. Make connections of the topics to current events and everyday phenomena.	3.22	AGREE
9. Move around, but not so much that of a distraction.	3.19	AGREE
10. Avoid direct repetition of material in a textbook so that it remains a useful alternative resource.	3.19	AGREE
OVERALL	3.17	AGREE

The table reveals that fundamentally the science teachers “agree” with an overall weighted mean of 3.17 on the items presented to them in the questionnaire in terms of the factors that affect students’ progress as to teaching styles. Item 8 got the highest weighted mean of 3.22, it deals with the science curriculum giving the science teachers the opportunity to make connections of the topics to the current events and everyday phenomena. One of the basic theories that is the basis of the K to 12 curriculum is reconstructionism, which is why teachers must be able to connect topics within the social context of the community. Correspondingly, Datu (2016) said that the curriculum aims to develop learners who are armed with sufficient competencies which could be achieved by actively applying and utilizing it in real world, actively testing ideas or concepts learned. With a weighted mean of 3.12, item 5 got the lowest; this statement focuses about the curriculum giving the opportunity for the science teachers to adapt learning experiences to the learners according to their developmental stage.

SCHOOL FACILITIES:

School Factor as to School Facilities:

Table 13: Weighted Means of the Factors Affecting Students' Progress as to School Facilities

SCHOOL FACTOR: SCHOOL FACILITIES	OVERALL	
Items	**WEIGHTED MEAN**	**VERBAL INTERPRETATION**
1. The overall design of the school in terms of aesthetic values for learning and appropriateness for the age of the students.	**3.06**	**AGREE**
2. Exterior noise and surrounding environment should not disrupt classes.	**3.20**	**AGREE**
3. The site and the building should be well landscape.	**3.15**	**AGREE**
4. Location of the facilities should enhance the learning climate of the school.	**3.19**	**AGREE**
5. Floor plans should direct student movement and minimize student disruptions	**3.23**	**AGREE**
6. Lighting system that provides proper intensity, diffusion and distribution of illumination.	**3.22**	**AGREE**
7. Sound control of the classroom that can provide a balance distribution of sound.	**3.22**	**AGREE**
8. Classroom windows that the passage of air so that students wouldn't be feeling being choke.	**3.25**	**AGREE**
9. Classroom and laboratory furniture that is functionally sound and facially attractive.	**3.27**	**AGREE**
10. School facilities that are both excellent cosmetically and structurally.	**3.19**	**AGREE**
OVERALL	**3.20**	**AGREE**

The table discloses that primarily the science teachers "agree" with an overall weighted mean of 3.20 on the items presented to them in the questionnaire in terms of the factors that affect students' progress as to school facilities. Largely, the science teachers agree that classroom and laboratory furniture that is functionally sound and facially attractive influences students' progress, as this is the item that garnered the highest weighted mean of 3.20. This might be because of the fact that in teaching science, laboratory is one of the basic needs in order for students to learn the concepts in science in a real world scenario. As Hofstein and Mamlok-Naaman (2007) state that laboratory experiences have been given a central role in science education. Many benefits are said to come from engaging students in laboratory activities. Consequently, according to Dr. Sheryl Reinisch, Dean of the College of Education Concordia University, studies indicate that high-quality classroom environments "help children feel safe, secure, and valued. As a result, self-esteem increases and students are motivated to engage in the learning process" (https://education.cu-portland.edu/blog/classroom-resources/welcoming-classrooms-better-students/, 5/23/2018).
Item 1 got the lowest weighted mean of 3.06. Lesser likelihood exist in this item that science teachers would agree that the overall design of school in terms of aesthetic values for learning and appropriateness for the age of the students. This implies that science teachers believe that the

overall aesthetic of the school is not much of a concern, as long as the school is clean and peaceful and students can learn the lessons the best possible way. Also, this might be because schools in the Philippines are built not by age level but by the design appropriate for the whole grade levels, notwithstanding the political intervention of the politicians.

School Factor as to Learning Materials:

Table 14: Weighted Means of the Factors Affecting Students' Progress as to Learning Materials

SCHOOL FACTOR: LEARNING MATERIALS	OVERALL	
Items	WEIGHTED MEAN	VERBAL INTERPRETATION
1. Capacity and resources in the library are adequate for the number of students in the school.	3.04	AGREE
2. Adequacy of tables and chairs in the classroom.	3.08	AGREE
3. Adequacy of equipment in the laboratory to be used in teaching science concepts.	3.12	AGREE
4. Sufficiency of the number of teachers' guide in the school.	3.12	AGREE
5. Availability of resources such as manila papers, chalk, models, charts and other teaching paraphernalia.	3.19	AGREE
6. The use of field trips/excursions in the school to explore science concepts.	2.99	AGREE
7. Availability of teaching soft wares in science and the use of computers in teaching and learning science concepts.	3.09	AGREE
8. Rigidity of procedures of acquiring the materials for learning.	3.08	AGREE
9. Adequacy of books given to each and every student.	3.22	AGREE
10. Sufficiency of visual resources such as videos, PowerPoint presentation and the like in teaching science concepts.	3.18	AGREE
OVERALL	3.11	AGREE

The table reveals that predominantly the science teachers "agree" with an overall weighted mean of 3.11 on items presented to them in the questionnaire in terms of the factors that affect students' progress as to learning materials.

With a weighted mean of 3.22, item 9 got the highest. More likely, the teachers would agree that adequacy of books given to each and every student influences their progress. This issue must have come into place because of the fact that in the Philippines, students were not given the chance to have a one is to one supply of textbooks. Critics in the Philippines suggest that this issue stem from the government's propensity to address shortages of inputs-through new classroom construction, teacher hiring, and textbook procurement-rather than focus on root causes of the under-performance, such as weak governance, political discontinuity, and lack of accountability (PIDS, 2009). Item 6 got the lowest weighted mean of 2.99, which implies that there is a lesser likelihood that the science teachers agree that the use of field trips/excursions in the school to explore science concepts influences students' progress. This might be because science teachers believed that mastery of science concepts can be done already in the school as long as there is an adequacy of materials needed in teaching the subject and there is availability of laboratory to perform experimental activities in teaching the subject. However, Berendt and Franklin (2014) have a different perspective; they said that effective methods to develop student interest include experiential activities and field trips, which create authentic learning opportunities for students, regardless of the content area. Also Lei (2010) argues that field trips take students to locations that are unique and cannot be duplicated in the classroom. Each student observes natural settings and creates personally relevant meaning to the experience. Interactive exhibits help students play with concepts, activities often not possible in the classroom.

School Factor as to Support to Teacher Training:

Table 15: Weighted Means of the Factors Affecting Students' Progress as to Support to Teacher Training

SCHOOL FACTOR: SUPPORT TO TEACHER TRAINING	OVERALL	
Items	WEIGHTED MEAN	VERBAL INTERPRETATION
1. Having a training and development policy applicable to all teachers.	3.24	AGREE
2. Intensifying echoing program of seminars and training attended.	3.26	STRONGLY AGREE
3. Intensifying linkage in from stakeholders for the purpose of training and development.	3.26	STRONGLY AGREE
4. A full-fledged training and development department in the school must be built and must be manned with competent professionals.	3.40	STRONGLY AGREE
5. Coordinators help teachers set realistic goals for performing their work as a result of their training.	3.27	STRONGLY AGREE
6. Schools make sure that teachers have the opportunity to use their training immediately.	3.24	AGREE
7. Schools must make it a point that equipment used in training is similar to the equipment found on real teaching scenario.	3.29	STRONGLY AGREE
8. Teachers who use their training are given preference for new assignments.	3.30	STRONGLY AGREE
OVERALL	3.28	STRONGLY AGREE

The table divulges that chiefly the science teachers "agree" with an overall weighted mean of 3.28 on the items presented to them in the questionnaire in terms of the factors that affect students' progress as to support to teacher training.

With a weighted mean of 3.40, item 4 got the highest. There is a great agreement from the science teachers that a full-fledged training and development department in the school must be built and must be manned with competent professionals really influences students' progress. Studies have shown that 'teacher quality' is the single most important school-level variable influencing student achievement (OECD, 2005). Recognition of the importance of teachers to student outcomes has resulted in a shift in aid investment from a primary focus on increasing access to education to increasing support for interventions aimed at improving teacher quality in developing countries (Colclough, 2005). Also, a recent review of 20 high-quality studies measuring the impact of teacher quality in developing countries found that teacher when subjected knowledge training was strongly related to student learning (Glewwe, Hanushek, Humpage & Ravina, 2011).

CONCLUSION

Based on the findings from this study, the following conclusions were drawn:

1. The perspectives of the science teachers foster a positive understanding of the science spiral progression curriculum as to content, strategies, and confidence in implementing the curriculum.
2. There are variations in the perspectives of the science teachers in executing the science spiral progression curriculum when compared by school.
3. The science teachers foster a favorable capacity of handling the progression in terms of identifying and fulfilling clearly the purpose of the curriculum, and choosing the best alternatives to teach the topics in the progression.

4. There are significant variations on how the science teachers handle the science progression curriculum across year levels.
5. The public junior high school grade ten students of Pasig City profess "fairly satisfactory" academic performance or progress in science.
6. There are many factors that may influence students' learning progress in the science spiral progression curriculum.

RECOMMENDATIONS

The following recommendations are drawn based on the findings of the study:

1. The Department of Education and its implementing arms may integrate plans in providing more concrete programs to support teachers' training in relation to the science spiral progression curriculum.
2. Principals in the public junior high schools may develop motivational plans that would encourage science teachers to continue to learn and to persuade graduate studies to enhance their knowledge on the disciplines of science that are not their area of specialization.
3. Principals in the public junior high schools may devise concrete and serious faculty development programs to be conducted as timely as possible not only on strategies on how to teach the science spiral progression curriculum but also the understanding of the content of each discipline in the science curriculum for the benefit of the science teachers who are teaching the science disciplines which are not their area of specialization.
4. Administration of each public junior high school may establish school-based training or cluster-based training program if there are financial constraints in sending teachers to big training events.
5. School administrators in the Department of Education may revisit the implementation of the science spiral progression curriculum and this research may guide them to trace immediate problems regarding the implementation of the curriculum.
6. Future researchers may conduct future researches in relation with this research on the following aspects: (a) effects of the scheme of implementation (disciplinal or not disciplinal) of the science spiral progression curriculum in the academic performance of the students (b) phenomenological plight that teachers are experiencing on executing the spiral progression curriculum (c) students' progress focusing on the individual disciplines in the science progression and (d) correlates of the academic performance of students in science in terms of their demographic profiles.

REFERENCES

1. Alonzo A.C. (2002): Evaluation of a Model for Supporting the Development of Elementary School Teachers' Science Content Knowledge. Proceedings of the Annual International Conference of the Association for the Education of Teachers in Science; Charlotte, NC.
2. Amukowa W. (2013): Analysis of factors that lead to poor performance in Kenya certificate of secondary examination in Embu district in Kenya. The International Journal of Social Sciences, 13(1): 92-108.
3. Andrew Zucker, Carolyn Staudt and Robert Tinker (2005): Teaching Graph Literacy across the Curriculum. National Science Teachers Association (NSTA). Reprinted with permission from Science Scope, Vol. 38, No. 6.
4. Arends R. (2001): Learning To teach. USA: McGraw Hill.
5. Bailey F. (2008): First Steps in Qualitative Data Analysis: Transcribing Family Practice. 25: 127–131.
6. Baxter A. and Hatt S. (2000): Everything Must Go: A Study of Clearing and First Year Progression. Journal of Further and Higher Education, 24(1): 5-14.
7. Black P., Harrison C., Lee C., Marshall B. and Wiliam D. (2002): Working Inside the Black Box: Assessment for learning in the Classroom. London: King's College London.
8. Brown R., Pressly M., Van Meter P. and Schuder T. (2004): A Quasi-Experimental Validation of Transactional Strategies Instruction with Low-Achieving Second-Grade Teachers. New York: International Reading Association.
9. Bruner J. (1960/1977): The Process of Education. Cambridge, MA: Harvard University Press.
10. Bruner J. (1987): Actual Minds, Possible Worlds. Cambridge, MA: Harvard University Press.
11. Chang M., Singh K. and Mo Y. (2007): Science engagement and science achievement: Longitudinal models using NELS data. Educational Research and Evaluation, 13(4): 349-371.
12. Chansarkar B.A. and A. Michaeloudis (2001): Student Profiles and Factors Affecting Performance International Journal in Mathematics Education and Science and Technology, 32(1).
13. Childs A. and McNicholl J. (2007): Science Teachers Teaching Outside of Subject Specialism: Challenges, Strategies Adopted and Implications for Initial Teacher Education. Teacher Development, 11(1): 1-20.

14. Clark S. (2010): Jerome Bruner: Teaching, Learning and the Spiral Curriculum. Community and Thought in Education.
15. Cobern W.W. and Loving C.C. (2001): Defining "Science" in a Multicultural World: Implications for Science Education. Science Education, 85(1): 50-67.
16. Cobern W.W., Schuster D., Adams B., Skjold B.A., Muğaloğlu E.Z., Bentz A. and Sparks K. (2014): Pedagogy of Science Teaching Tests: Formative Assessments of Science Teaching Orientations. International Journal of Science Education, 36(13): 2265-2288.
17. Cooper H., Robinson J.C. and Patall E.A. (2006): Does Homework Improve Academic Achievement? A Synthesis of Research, 1987–2003. *Review of Educational Research, 76*(1): 1-62.
18. Crawford B.A. (2000): Embracing the Essence of inquiry: New Roles for Science Teachers. Journal of Research in Science Teaching, 37: 916-937.
19. Crawford B.A. (2007): Learning to Teach Science as Inquiry in the Rough and Table of Practice. Journal of Research in Teaching.
20. Creswell J.W. and Miller D.L. (2000): Determining Validity in Qualitative Inquiry. Theory into Practice, 39(3): 124-131.
21. Darling-Hammond L. and Ifill-Lynch O. (2006): If They'd Only Do Their Work!. Educational Leadership, 63(5): 8-13.
22. Del Rosario, Asuncion C. (2005): Basic Statistics with Probability. 2nd Ed. Malate, Manila: Del Ros Publishing House.
23. Dewey J. (1910/1997): How We Think. New York: Dover Publications.
24. Dewey J. (1938): Experience and Education. New York: Macmillan.
25. Estolas, Josefina V. (1995): Fundamentals of Research, Revised Edition, Manila Miranda Bookstore.
26. Ferido M.B. (2013): The Spiral Progression Approach in Science. Manila, Philippines: UP NISMED.
27. Fernández-Alonso R., Suárez-Álvarez J. and Muñiz J. (2015): Adolescents' Homework Perfromance in Mathematics and Science: Personal Factors and Teaching Practices. Journal of Educational Psychology. Advance Online Publication.
28. Glickman-Bond J. and Rose K. (2006): Creating and Using Rubrics in Today's Classrooms, Norwood, MA: Christopher-Gordon Publishers, Inc.
29. Hartley J. (2002): Note Taking in Non Academic Settings: A Review. Applied Cognitive Psychology, 16: 559-574.
30. Issa A.O., Aliyu M.B., Akangbe R.B. and Adedeji A.F. (2012): Reading Interest and Habits of the Federal Polytechnic Students. International Journal of Learning & Development, 2(1): 470-486.
31. Johnson D.W., Johnson R.T. and Smith K.A. (2014): Cooperative Learning: Improving University Instruction by Basing Practice on Validated Theory. Journal on Excellence in College Teaching, 25: 85-118.
32. Kind V. and Kind P.M. (2011): Beginning to Teach Chemistry: How Personal and Academic Characteristics of Pre-service Science Teachers Compare with their Understandings of Basic Chemical Ideas. International Journal of Science Education, 33 (15): 2123-2158.
33. Kumar R., Gheen M.H. and Kaplan A. (2002): Goal Structures in the Learning Environment and Students' Disaffection from Learning and Schooling. In C. Midgley (Ed.), Goals, Goal Structures, and Patterns of Adaptive Learning (pp. 143-174). Mahwah, NJ: Erlbaum.
34. Leedy, Paul D. and Ormrod, Jeanne E. (2014): Practical Research and Design. Pearson Publishing.
35. Lei S.A. (2010): Assessment Practices of Advanced Field Ecology Courses Education, 130(3): 404-415.
36. Nocon, Ferdinand (2000): General Statistics Made Simple for Filipinos. Mandaluyong City: National Bookstore Inc.
37. Onwuegbuzie A.J. and Leech N.L. (2007): An Array of Qualitative Data Analysis Tools: A Call for Data Analysis Triangulation. School Psychology Quarterly, 22(4): 557.
38. Onwuegbuzie A.J. and Leech N.L. (2007): Validity and Qualitative Research: An Oxymoron? Quality and Quantity, 41: 233–249.
39. Papong E. (2012): The Influence of John Dewey's Educational Thoughts on Philippine Education.
40. Sleeter C.E. (2001): Preparing Teachers for Culturally Diverse Schools: Research and the Overwhelming Presence of Whiteness. Journal of Teacher Education, 52(2): 94-106.
41. Trumbull, John (2005): Leading With Diversity: Cultural Competencies for Teachers Preparation and Professional Development. Brown University.
42. Wery J. and Thomson M.M. (2013): Motivational strategies to enhance effective learning in teaching struggling students. British Journal of Learning Support, 28(3): 103-108.
43. Yen T.S. and Halili S.H. (2015): Effective Teaching of Higher-Order Thinking (HOT) in Education. The Online Journal of Distance Education and e-Learning, 3(2): 41.

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