SCIENCE TEACHERS' PROFILE, COMPETENCIES AND ATTITUDES ON THE SPIRAL PROGRESSION APPROACH VIS-À-VIS STUDENTS' ACADEMIC PERFORMANCE

Aina B. Iglesia
Email: iglesia.aina@wmsu.edu.ph
Western Mindanao State University
Normal Road, Baliwasan, Zamboanga City, Philippines

ABSTRACT: *This quantitative descriptive study investigated the relationship between junior high school Science teachers' profiles, competencies, and attitudes toward the Spiral Progression Approach and their students' academic performance across Earth Science, Biology, Chemistry, and Physics during the 2015-2016 school year in Zamboanga City. Utilizing documentary analysis, correlation designs, total teacher enumeration, and student cluster sampling, the research revealed that while most teachers were Earth Science majors with over 20 years of experience, highly competent in instructional strategies, and favorable toward the spiral approach, their specialization and length of service did not predict student performance. Ultimately, students achieved satisfactory grades across all four science areas, and while teachers' knowledge in Biology significantly contributed to student performance in that specific subject, their overall competencies, content knowledge, and attitudes had no broader influence on students' general academic outcomes or their own perspectives on the Spiral Progression Approach.*

Keywords: Science teachers' profile, competencies, attitudes, spiral progression approach, academic performance

INTRODUCTION

The implementation of the K to 12 Basic Education Program in 2012 marked a major educational reform in the Philippines, aimed at enhancing the quality of basic education by extending the school cycle to twelve years and introducing the learner-centered, inquiry-based Spiral Progression Approach (SPA) to the Science curriculum [31]. Spearheaded by Jerome Bruner's educational philosophy, the SPA addresses the deficiencies of the previous discipline-based, compartmentalized curriculum by revisiting scientific concepts and skills across Earth Science, Biology, Chemistry, and Physics with increasing difficulty and complexity at each grade level [4, 5, 6, 7]. This structured approach connects science to real-world applications and indigenous technologies, fostering critical thinking, teamwork, and scientific literacy to cultivate a workforce capable of navigating the country's socio-economic and industrial challenges [31].The ultimate success of this curriculum shift depends heavily on classroom teachers, who must transition from traditional lecturers to facilitators equipped with robust subject knowledge, pedagogical expertise, and strong content familiarity across all four branches of science [17]. Research underlines that teachers' confidence, instructional strategies, and adaptability to ongoing educational changes directly influence how effectively students absorb complex material [23]. Because curriculum transitions inherently generate pedagogical challenges and anxiety among educators, open communication, regular administrative updates, and the prompt provision of localized instructional materials are vital to supporting teachers in managing these shifting classroom dynamics [20].

Empirical studies assessing the spiral framework reinforce its potential to enhance academic achievement and retain technical proficiency far better than traditional textbook-driven or lecture-based formats. By continuously revisiting core concepts in diverse contexts, the spiral model systematically strengthens students' foundational knowledge, collaborative skills, and practical problem-solving capabilities without superficially isolating topics [13]. Consequently, evaluating how Science teachers' distinct profiles, strategic competencies, and attitudes toward the SPA intersect with student outcomes remains essential for identifying instructional gaps and ensuring that schools successfully nurture highly participative, scientifically literate citizens [1, 28].

Research Objectives

The main objective of this study is to determine the relationship between junior high school Science teachers' profiles, competencies, and attitudes toward the Spiral Progression Approach (SPA) and the academic performance of students in the four core areas of Science (Earth Science, Biology, Chemistry, and Physics) in the public high schools of Zamboanga City.

Specifically, the study aims to achieve the following objectives.

1. To profile the Science teacher-respondents in terms of their: 1.1. Area of specialization; and 1.2. Length of service in teaching Science.
2. To assess the competencies of the Science teachers with regard to: 2.1. The instructional strategies utilized in the classroom; and 2.2. Their foundational knowledge of core science content.
3. To determine the attitudes of the Science teachers toward the implementation and use of the Spiral Progression Approach (SPA).
4. To evaluate the academic performance of the students under the Spiral Progression Approach across the four distinct branches of Science: 4.1. Earth Science; 4.2. Biology; 4.3. Chemistry; and 4.4. Physics.
5. To ascertain if a significant difference exists in the teachers' strategic competencies and attitudes toward the Spiral Progression Approach when their data are grouped according to their profile variables (area of specialization and length of service).

6. To determine if there is a significant difference in the students' academic performance across the four science disciplines when categorized according to the profiles of their respective Science teachers.
7. To examine whether there is a significant relationship between the teachers' instructional competencies and their overall attitudes toward the Spiral Progression Approach.
8. To evaluate the significant relationship between the teachers' instructional and content competencies and the students' academic performance in Earth Science, Biology, Chemistry, and Physics.
9. To analyze whether a significant relationship exists between the teachers' attitudes toward the Spiral Progression Approach and the resulting academic performance of the students in the four areas of Science.

METHODS

The study utilized the quantitative descriptive method of research particularly the documentary analysis. It employed quantitative approaches through statistical methods in analyzing existing data and determining the relationships of the variables. It sought to give a detailed description and analysis of the teachers' profile such as the area of specialization and the length of service in teaching Science; competencies, and attitudes of Science teachers on the Spiral Progression Approach. It also sought to determine the academic performance in Earth Science, Biology, Chemistry and Physics of the junior high school students in the public high schools in Zamboanga City division.

Data Analysis Procedure

To facilitate an efficient data analysis process, the researcher ensured that the main objectives of the study were directly reflected in the questionnaire checklists, subsequently applying a structured set of statistical tests to enhance the validity of the conclusions. Specifically, frequency counts and percentages were used to address problem number 1, while mean and weighted mean calculations were utilized for problem numbers 2 and 3. Additionally, student proficiency levels were employed to answer problem number 4, a one-way ANOVA was executed for problem numbers 5 and 6, and the Pearson Product-Moment Correlation was utilized to analyze the relationships outlined in problem numbers 7, 8, and 9.

RESULTS AND DISCUSSION

What is the Science teachers' profile in terms of the following:1.1 Area of specialization and 1.2 Length of service in teaching Science?

Table 1 below presents the teachers' profile of the four public secondary schools in terms of the area of specialization in Science. As seen in the table, out of 119 teacher- respondents, 58 or 48.74% are Earth Science majors, 23 or 19.3% are Biology majors, 21 or 17.6% are Physics majors and 17 or 14.2% are Chemistry majors. The result implies that the majority of the Science teachers have Earth Science as their area of specialization, whose tasks are to provide a strong foundation for students with an in-depth knowledge of General Science programs, or a combination of the Biological and Physical Science subject matter.

Table 1.SCIENCE TEACHERS' PROFILE IN TERMS OF AREA OF SPECIALIZATION

Earth Science		Biology		Chemistry		Physics		Total	
n	%	n	%	n	%	n	%	n	%
58	48.74	23	19.3	17	14.2	21	17.6	119	100

Table 2 shows the profile data regarding the teacher-respondents' length of service reveals that out of 119 participants, a majority of 54 teachers (45.38%) have been teaching Science for more than 20 years, while 34 (28.57%) have 10 to 20 years of experience, and 31 (26.05%) have less than 10 years, implying a predominantly experienced workforce in the field. Within this study, experienced educators are characterized by their ability to maintain student motivation, manage classrooms effectively, and fluidly adapt lessons to unexpected learning opportunities. This profile is supported by the foundational literature of Martin, Yin, and Mayall (2006) [20], who found that experienced teachers excel at establishing structural classroom routines and managing group dynamics with less reactive behavior than novices. Furthermore, this aligns with Gatbonton's (2008) [17] findings that while novice teachers often remain preoccupied with immediate student behaviors and negative reactions, veteran educators prioritize overall pedagogical outcomes and ensure that substantive learning is actively taking place.

Table 2
SCIENCE TEACHERS' PROFILE IN TERMS OF LENGTH OF SERVICE IN TEACHING SCIENCE

Below 10 yrs		10-20 yrs		above 20 yrs		Total	
n	%	n	%	n	%	n	%
31	26.05	34	28.57	54	45.38	119	100

What are the Science teacher's competencies in terms of the following: 2.1. Strategies utilized and 2.2. Knowledge of contents?

Table 3
Science Teachers' Competencies In Terms Of The Strategies Utilized On The Spiral Progression Approach In The New Science Curriculum

STRATEGIES	WEIGHTED MEAN	DESCRIPTION
Cooperative Learning	4.16	Very Competent
Think-Pair-Share	3.31	Competent
Brainstorming	3.78	Very Competent
Bloom's Questioning	4.02	Very Competent
5 E's	4.06	Very Competent
Jigsaw	3.07	Competent
Concept Maps	3.45	Very Competent
K-W-L Charts	3.46	Very Competent
Multimedia Ins.	3.52	Very Competent
Role Plays	3.29	Competent
HOTS	3.58	Very Competent
Journal	3.18	Competent
Rubric	3.73	Very Competent
4 A's	3.50	Very Competent
GRAND MEAN	**3.58**	**Very Competent**

Data shows that the Science teachers are highly proficient overall, earning a "Very Competent" rating (3.58) for their ability to adapt various instructional methods to diverse student needs, interests, and learning styles. Specifically, they demonstrate exceptional competence in executing cooperative learning (4.16), the 5 E's (4.06), Bloom's questioning techniques (4.02), brainstorming (3.78), rubrics (3.73), and higher-order thinking skills (3.58), while maintaining solid competency in strategies like think-pair-share (3.31), role plays (3.29), journaling (3.18), and jigsaws (3.07). This high level of pedagogical flexibility underscores that there is no single best approach to instruction, as effective educators master and fluidly combine different strategies to achieve distinct learning objectives.

Table 4
Science Teachers' Competencies in terms of Knowledge of Contents in Earth Science And Chemistry

Grade	Area	Mean	Description
8	Earth Science	20.90	Very Satisfactory
9	Earth Science		
8	Chemistry	21.96	Very Satisfactory
9	Chemistry		

Table 5
Science Teachers' Competencies in terms of Knowledge of Contents in Biology and Physics

Grade	Area	Mean	Description
7	Biology	24.91	Outstanding
10	Biology		
7	Physics	20.07	Very Satisfactory
10	Physics		

Table 4 and 5 shows Science teachers' competencies in terms of the knowledge of the contents in Earth Science and Chemistry, Biology and Physics. Data reveals that the teacher-respondents have an outstanding knowledge in Biology (24.91). However, they have satisfactory performance in Chemistry (21.96); Earth Science (20.90), and Physics (20.07).

What are the Science teachers' attitudes on the Spiral Progression Approach?

Table 6
Science Teachers' Attitudes on the Spiral Progression Approach

My Science teaching…	MEAN	DES.
is interesting because the learners are exposed to a wide variety of concepts/topics, skills and attitudes to give various learning opportunities	3.90	Agree
is easier because lessons are progressively elaborated when reintroduced leading to the learners' broadened understanding and better learning takes place.	3.55	Agree
is more challenging because it is a learner-centered approach; hence lessons are related to the learner's own experiences.	3.83	Agree
is more relieving because previously learned concepts of students are reviewed, thus, improving students' retention.	3.59	Agree
is more rewarding because the construction of lessons, activities, and projects lead to the development of students' thinking skills and dispositions; hence, the desired goals/performances are achieved.	3.71	Agree
assumes the role of a facilitator—helping, assisting, guiding, and supervising to achieve desired mastery and learning outcomes.	4.02	Agree
is challenging because the learners are exposed to hands-on activities, thus, creating meaningful learning experiences.	4.11	Agree
addresses easily some doubts on key concepts of topics because of the ideal number of students inside the class.	3.33	Undecided
is more interesting because different teaching strategies are enhanced, thus, paving the way for deeper understanding of the key concepts of the lessons.	3.79	Agree
gives the learners the opportunity to learn independently where they find answers to their own questions in a scientific manner, thus, facilitating lifelong learning skills.	3.84	Agree
is more fulfilling because student confidence is developed through a wide variety of teaching-learning experiences.	3.78	Agree
is logically organized because topics are presented from simple to complex, thus, strengthens retention, mastery of topics and skills are achieved.	3.60	Agree
is more tiresome because it covers a wide range of topics on various disciplines requiring a lot of preparation.	3.52	Agree
is more confusing because it does not provide coherence in the curriculum. (Coherence- logical consistency of lessons)	3.30	Undecided
is more difficult because remedial interventions cannot be done easily when topics are presented in a mixed/integrated manner.	3.40	Agree
is more ineffective/inefficient because of the multiple topics given to students, thus, less time is devoted to master each one.	3.30	Undecided
is more discomforting because it requires specific training on some other areas of science and needs various teaching techniques.	3.53	Agree
is incoherently done in some topics in the other areas of science because of the lack of in-depth knowledge on it.	3.61	Agree
provides insufficient examples on some topics to avoid more confusion on the part of the students.	3.34	Undecided
is presented more of performance-based, thus, outcomes (products) require a lot of skills and preparations.	3.94	Agree
GRAND MEAN	**3.65**	**Agree**

Table 6 indicates that Science teachers maintain a generally positive yet nuanced attitude toward the Spiral Progression Approach, strongly agreeing that it offers a highly beneficial, learner-centered framework. They note that the approach creates meaningful learning experiences through hands-on activities (4.11), allows teachers to effectively act as facilitators (4.02), exposes students to a motivating variety of concepts (3.90), and naturally promotes independent, lifelong learning skills (3.84) while boosting student confidence (3.78). However, the data also highlights prominent operational hurdles; teachers agree that the curriculum's performance-based nature requires extensive skill and lesson preparation (3.94) and can feel tiresome due to the vast range of disciplines covered (3.52). Furthermore, they point out systemic difficulties, expressing that a lack of in-depth across-the-board subject knowledge can lead to localized topic incoherence (3.61), that the model demands discomforting levels of specialized, multi-disciplinary training (3.53), and that executing timely remedial interventions becomes noticeably more difficult when distinct science topics are presented in an integrated manner (3.40).

What are the students' academic performances using the Spiral Progression Approach?

Table 7-10 shows the students' academic performances in Earth Science, Biology, Chemistry and Physics. The data reveal that the respondents have satisfactory performances in all the four areas in Science such as in Biology (83.47%), Earth Science (82.48%), Physics (82.24%), and Chemistry (81.71%). The data implies that the students have developed the fundamental knowledge and skills and core understandings and with little guidance from the teacher and/or with some assistance from peers, can transfer these understandings through authentic performance tasks (DepEd, 2012).

Table 7
Students' Academic Performance in Earth Science

GRADE LEVEL	PROFICIENCY LEVEL	DESCRIPTION
8	83.48%	Satisfactory
9	81.48%	Satisfactory
Average	**82.48%**	**Satisfactory**

Table 8
Students' Academic Performance in Biology

GRADE LEVEL	PROFICIENCY LEVEL	DESCRIPTION
7	81.92%	Satisfactory
10	85.02%	Very Satisfactory
Average	**83.47%**	**Satisfactory**

Table 9
Students' Academic Performance in Chemistry

GRADE LEVEL	PROFICIENCY LEVEL	DESCRIPTION
8	83.62%	Satisfactory
9	79.79%	Fairly Satisfactory
Average	**81.71%**	**Satisfactory**

Table 10
Students' Academic Performance in Physics

GRADE LEVEL	PROFICIENCY LEVEL	DESCRIPTION
7	81.60%	Satisfactory
10	82.88%	Satisfactory
Average	**82.24%**	**Satisfactory**

Is there a significant difference in the Science teachers' competencies and attitudes on the Spiral Progression Approach when the variable is categorized according to profile?

Tables 11 and 12 present an analysis of Science teachers' competencies on the Spiral Progression Approach (SPA) categorized by their area of specialization, revealing distinct outcomes for pedagogical strategies versus content knowledge. In terms of instructional strategies, the data indicate no significant difference among teachers ($F = 0.15$, $p = 0.929 > 0.05$), implying that educators possess a uniform level of strategic competency regardless of their major. However, a significant difference emerges regarding content knowledge ($F = 5.804$, $p = 0.001 < 0.05$), where a follow-up Scheffé test highlights that both Earth Science majors ($p = 0.003$) and Chemistry majors ($p = 0.01$) demonstrate significantly higher content competencies when compared directly to Biology teachers.

Table 11
Science Teachers' Competencies on the Spiral Progression Approach when the Variable is categorized according to area of specialization

Teachers' Competencies	Source of Variation	Sum of Squares	df	Mean Square	F	Sig. Val	Int
Knowledge of Contents	Between Groups	679.16	3	226.38	5.80	.001	S
	Within Groups	4485.629	115	39.00			
	Total	5164.790	118				
Strategies Utilized	Between Groups	.095	3	0.03	.15	.929	NS
	Within Groups	24.362	115	.21			
	Total	24.458	118				

Table 12
Science Teachers' Competencies on the content in the new Science Curriculum when the variable is categorized according to area Of specialization

Area of Specialization		Mean Diff.	Std. Error	Sig.	95% Confidence Interval	
					Lower Bound	Upper Bound
Earth Science	Biology	5.928	1.53896	.003	1.5622	10.2953
	Chemistry	-.9868	1.72248	.954	-5.8741	3.9005
	Physics	1.284	1.59057	.884	-3.2281	5.7979
Biology	Chemistry	-6.915	1.99758	0.010	-12.583	-1.2478
	Physics	-4.643	1.88502	.115	-9.9923	.7045
Chemistry	Physics	2.271	2.03761	.743	-3.5097	8.0531

Table 13 displays the analysis of Science teachers' competencies on the Spiral Progression Approach (SPA) categorized by their length of service, revealing uniform proficiency across both pedagogical and content dimensions. Regarding instructional strategies, the statistical findings ($F = 0.878$, $p = 0.418 > 0.05$) demonstrate no significant difference, indicating that educators possess comparable skills in executing SPA classroom methodologies regardless of their teaching tenure. Similarly, the evaluation of content knowledge yields no significant variance ($F = 2.698$, $p = 0.072 > 0.05$), implying that teachers maintain a consistent level of subject-matter mastery across the curriculum irrespective of their years of experience in the field.

Table 13
Science Teachers' Competencies on the Spiral Progression Approach when the variable is categorized according to Length of Service in Teaching Science

Teachers' Compt.	Source of Var/	Sum of Squares	df	Mean	F	Sig. Val	Int
Knowledge of Contents	Between Groups	229.538	2	114.7	2.698	.072	NS
	Within Groups	4935.25	116	42.54			
	Total	5164.79	118				
Strategies Utilized	Between Groups	.365	2	.182	.878	.418	NS
	Within Groups	24.093	116	.208			
	Total	24.458	118				

Table 14 presents the teachers' attitudes on the Spiral progression Approach when the variable is categorized according to the area of specialization. Data show that in terms of the attitudes on the SPA, the F value of 2.290 has a significant value of .082 which is greater than alpha 0.05. Therefore, there is no significant difference in the teachers' attitudes on the Spiral Progression Approach when the variable is categorized according to area of specialization. This implies that Science teachers have the same favorable attitudes on the Spiral Progression Approach.

Table 14
Science Teachers' Attitudes on the Spiral Progression Approach when the variable is categorized according to Area of Specialization

Source of Variation	Sum of Squares	df	Mean Square	F	Sig. Val	Int.
Between Groups	1.090	3	.363	2.290	.082	NS
Within Groups	18.249	115	.159			
Total	19.339	118				

Table 15 presents the teachers' attitudes on the Spiral progression Approach when the variable is categorized according to length of service in teaching Science. Data show that in terms of the attitudes on the SPA, the F value of 2.738 has a significant value of 0.069 which is greater than alpha 0.05. Therefore, there is no significant difference in the teachers' attitudes on the Spiral Progression Approach when the variable is categorized according to length of service in teaching Science. This implies that teachers who are below 10 years, 10 to 20 years, and 21 years and above have the same favorable attitudes on the Spiral Progression Approach.

Table 15
Science Teachers' Attitudes on the Spiral Progression Approach when the Variable is Categorized According to Length of Service in Teaching Science

Source of Variation	Sum of Squares	df	Mean Square	F	Sig. Val	Int.
Between Groups	.872	2	.436	2.738	.069	NS
Within Groups	18.468	116	.159			
Total	19.339	118				

Is there a significant difference in the students' academic performance in Earth Science, Biology, Chemistry and Physics using the Spiral Progression Approach when the variable is categorized according to Science teachers' profile?

The succeeding Table 16 presents the students' academic performance in Earth Science, Biology, Chemistry and Physics when the variable is categorized according to teachers' area of specialization. Data show that the F value of 0.597 has a significant value of 0.618 which is greater than alpha 0.05. Therefore, there is no significant difference in the students' academic performance when the variable is categorized according to area of specialization. This implies that students' performance in Science is the same. The results of this study ran contrary to Lawrenz (1995) which revealed that teachers' knowledge on the subject matter is positively related to student's achievements. Subject matter specialization is 'sine qua non' for every teacher. Generally, it is assumed and expected that the teacher must acquire a reasonable measure of knowledge of the subject in order to reasonably cope with the demands of teaching. He also stressed that the area of specialization culminates in subject matter knowledge; knowledge is dynamic, and the acquisition of current information is sometimes costly and not easy to come by.

Table 16
Students' Academic Performance in Earth Science, Biology, Chemistry and Physics when the variable is Categorized According to Teachers' Area Of Specialization

Source of Variation	Sum of Squares	df	Mean Square	F	Sig. Val	Int.
Between Groups	39.934	3	13.311	.597	.618	NS
Within Groups	2565.361	115	2.307			
Total	2605.296	118				

Table 17 presents the students' academic performance in Earth Science, Biology. Chemistry and Physics when the variable is categorized according to teachers' length of service in teaching Science. The ANOVA result revealed that the F value of 0.880 has a significant value of 0.418 which is greater than alpha 0.05. Therefore, this yielded no significant difference in the students' academic performance when the variable is categorized according to length of service in teaching Science. This implies that students' performance in Science is relatively the same. The result is affirmed by the study of Andrew and Schwab (1995), which pointed out that inexperienced teachers from lengthy teacher education programs, can be as efficient as experienced teachers. The results of this study ran contrary to Darling-Hammond (1999), which pointed out that teachers with less than three years' experience are less efficient than colleagues with more experience.

Table 17
Students' Academic Performance in Earth Science, Biology, Chemistry and Physics when the variable is categorized according to Length of Service in Teaching Science

Source of Variation	Sum of Squares	df	Mean Square	F	Sig. Val	Int.
Between Groups	39.934	3	13.311	.597	.618	NS
Within Groups	2565.361	115	2.307			
Total	2605.296	118				

Table 18 presents the significant relationship between the teachers' competencies on content and strategies utilized and the teachers' attitudes on the Spiral Progression Approach. Data show that the Pearson Correlation r value of -0.029 has a significant value of 0.752 which is greater than alpha 0.05. Therefore, the result showed no significant relationship between teachers' competencies on content and attitudes on the Spiral Progression Approach.

In addition, it can be gleaned from the table, the significant relationship between the teachers' competencies on the strategies utilized and attitudes on the Spiral Progression Approach. Data disclosed that the Pearson Correlation r value of 0.116 has a significant value of 0.208 which is greater than alpha 0.05. Therefore, there is no significant relationship between teachers' competencies on the strategies utilized and attitudes on the Spiral Progression Approach.

Table 18
Relationship Between the Teachers' Competencies and Attitudes on the Spiral Progression Approach

Variables	r – Value	Sig	Int
Teachers' Competency on Content and Attitudes	-0.029	0.752	NS
Teachers' Competency on Strategies Utilized and Attitudes	0.116	0.208	NS

Is there a significant relationship between the teachers' competencies and the students' academic performances in Earth Science, Biology, Chemistry and Physics using the Spiral Progression Approach?

Table 19 illustrates the relationship between teachers' content competencies and students' academic performance under the Spiral Progression Approach, revealing that Biology is the only discipline out of the four core areas to demonstrate a statistically significant positive correlation ($r = 0.373$, $p = 0.003 < 0.05$). This indicates that higher content competency among Biology teachers directly corresponds to stronger student performance in the subject, whereas no significant relationships are observed in Earth Science ($r = -0.198$, $p = 0.139 > 0.05$), Chemistry ($r = 0.167$, $p = 0.214 > 0.05$), or Physics ($r = 0.202$, $p = 0.116 > 0.05$), implying that a teacher's content mastery in these three fields does not necessarily dictate student academic outcomes. Interestingly, the lack of a significant correlation in Chemistry contrasts with findings by Kind (2014), who argued that non-Chemistry majors often lack the deeper subject exposure and instructional flexibility required to successfully tailor high school Chemistry concepts to diverse learner needs.

Table 19
Relationship Between the Teachers' Competencies on the Content and the Students' Academic Performance using the Spiral Progression Approach

Variables	r – Value	Sig	Int
Teachers' Competency in Biology and Students' Academic Performance in Biology	0.373	0.003	S
Teachers' Competency in Earth Science and Students' Academic Performance in Earth Science	-0.198	0.139	NS
Teachers' Competency in Chemistry and Students' Academic Performance in Chemistry	0.167	0.214	NS
Teachers' Competency in Physics and Students' Academic Performance in Physics	0.202	0.116	NS

Is there a significant relationship between the teachers' attitudes on the Spiral Progression Approach and the students' academic performances in Earth Science, Biology, Chemistry and Physics?

Table 20 illustrates that there is no statistically significant relationship between teachers' attitudes toward the Spiral Progression Approach and students' academic performance across all four core branches of Science, as evidenced by the non-significant correlation values for Earth Science ($r = 0.030$, $p = 0.826 > 0.05$), Chemistry ($r = -0.031$, $p = 0.817 > 0.05$), Biology ($r = 0.073$, $p = 0.571 > 0.05$), and Physics ($r = -0.019$, $p = 0.885 > 0.05$). These findings imply that a teacher's individual attitude toward this curriculum model does not serve as a predictor or influential factor for student grades, a result that is directly affirmed by Obadara (2008), who similarly found no significant relationship between teaching attitudes and academic performance. However, this outcome stands in stark contrast to the work of Avaa (2011), who contended that a teacher's attitude inevitably reflects in their instructional execution and adversely impacts student outcomes, as well as Olatunde (2009), who emphasized that educators' attitudes and teaching methodologies heavily shape the corresponding attitudes and achievement levels of their students.

Table 20
Relationship Between the Teachers' Attitudes and the Students' Academic Performance

Variables	r – Value	Sig	Int
Teachers' Attitudes and Students' Academic Performance in Earth Science	0.030	0.826	NS
Teachers' Attitudes and Students' Academic Performance in Chemistry	-0.031	0.817	NS
Teachers' Attitudes and Students' Academic Performance in Biology	0.073	0.571	NS
Teachers' Attitudes and Students' Academic Performance in Physics	-0.019	0.885	NS

CONCLUSION

The study reveals that the majority of Science teachers in Zamboanga City are Earth Science majors with over 20 years of teaching experience, maintaining an overall high level of pedagogical flexibility with a "very competent" rating in executing strategies like cooperative learning, the 5Es, and brainstorming, alongside a favorable attitude toward the Spiral Progression Approach (SPA). While Earth Science and Chemistry majors display higher content competencies than Biology majors, teachers generally perform very satisfactorily across most fields and exceptionally well in Biology. Ultimately, students achieved a satisfactory academic performance across all four core science areas. However, teachers' demographic profiles, specifically their area of specialization and length of service as well as their strategic competencies, content knowledge, and attitudes toward the SPA do not serve as predictors for student academic outcomes or influence their own perspectives on the curriculum. The single notable exception is in the field of Biology, where a teacher's content mastery directly and significantly corresponds to their students' corresponding academic performance.

RECOMMENDATIONS

To elevate student academic performance beyond a satisfactory level, Science teachers must exert greater effort by setting high educational standards, offering strong emotional support, and dynamically tailoring their instructional repertoires to fit diverse student learning styles, interests, and needs. Given the significant relationship between a teacher's content mastery and student success in Biology, educators should continuously refine their classroom strategies to foster independent learning capabilities and whole-person student development. Concurrently, the Department of Education (DepEd) must enhance institutional supervision, boost teacher motivation, provide adequate facilities, and systematically pilot or evaluate curriculum changes to ensure that the Spiral Progression Approach is genuinely attuned to societal needs rather than risking the systemic failures seen in other countries. Ultimately, reform makers must implement comprehensive, long-term evaluation plans, while future researchers should replicate this study in different settings incorporating other core subjects like English and Mathematics to uncover additional variables that significantly impact student academic outcomes over time.

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