Compliance and Commitment of Teachers in Teaching Science
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COMPLIANCE AND COMMITMENT OF TEACHERS IN TEACHING SCIENCE

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Abstract

This study examined the extent of compliance and level of commitment of teachers in teaching Science in Southern Negros under the Negros Occidental Division, Philippines, during the School Year 2023–2024. Employing a descriptive research design, the study involved 285 Science teachers as respondents and utilized a researcher-made survey questionnaire. The instrument was validated using the criteria of Carter V. Good and Douglas E. Scates, and reliability testing was conducted among 30 teachers in the Canlaon City Division using Cronbach's Alpha. Data were analyzed using descriptive and comparative statistical methods, including frequency counts, percentages, means, the Mann–Whitney U test, and Spearman's rho. Results revealed that teachers demonstrated high compliance with science teaching standards and a strong commitment to instructional practices, including the use of appropriate pedagogical approaches and assessment strategies. Furthermore, teachers' demographic characteristics were found to significantly influence their levels of compliance and commitment in science instruction. The study concludes that Science teachers exhibit strong adherence to standards and dedication to effective teaching practices. Based on the findings, an intervention plan focusing on professional development and institutional support is recommended to further strengthen compliance and commitment in science teaching.

Keywords: Teacher compliance; teacher commitment; science education; professional development; instructional support

Bio-notes:

Bbshiel C. Baylin is a passionate and dedicated secondary educator with over twelve years of experience in teaching science. He holds a Doctor of Philosophy in Educational Management (ongoing) from STI-West Negros University, a Master of Arts in Education from Central Philippines State University, and a Bachelor of Secondary Education majoring in General Science from Negros State College of Agriculture. Currently, he serves as a Grade 8 Science Teacher and Science Coordinator at Quirico G. Manzano Memorial National High School, West Candoni, Negros Occidental. He has previously taught as an Instructress at Central Philippines State University-Candoni Campus. Bbshiel is highly skilled in leadership, adaptability, communication, time management, problem-solving, and creativity, and is committed to supporting learners holistically—academically, socially, and emotionally. He is fluent in both Filipino and English and is dedicated to fostering a positive and engaging learning environment that inspires students to reach their full potential.

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Introduction

Rationale

The quality of science education in Southern Negros under the Negros Occidental Division is largely influenced by teachers' compliance with prescribed teaching standards and their level of commitment to effective science instruction. While policies such as DepEd Memorandum No. 160, Series 2022, provide clear guidelines for enhancing teacher competencies, integrating technology, and updating curricula, variations in their implementation remain evident across schools (Department of Education [DepEd], 2022). Differences in the application of science process skills, learner-centered pedagogical approaches, and assessment practices suggest uneven adherence to these standards among science teachers.

These inconsistencies may stem from differences in teachers' professional preparation, access to instructional resources, and engagement in continuous professional development. Research indicates that teachers' instructional practices are shaped not only by policy mandates but also by contextual and personal factors, including workload, training opportunities, and institutional support (Darling-Hammond et al., 2017; OECD, 2019). In some schools, science instruction reflects inquiry-based and constructivist approaches, while in others it remains teacher-centered, highlighting disparities in instructional quality.

Moreover, teachers' commitment to science teaching—manifested through continuous learning, instructional innovation, and responsiveness to learners' needs—plays a crucial role in the effective implementation of curricular standards. Highly committed teachers are more likely to adopt updated teaching strategies, integrate technology meaningfully, and design assessments that promote higher-order thinking skills (Day et al., 2007; Jones, 2019). Conversely, limited commitment may lead to minimal compliance and routine instructional practices, thereby negatively affecting student engagement and achievement. Understanding how teachers' personal and professional characteristics relate to their compliance and commitment is therefore essential in designing targeted interventions that enhance instructional quality and promote continuous improvement in science education.

Literature Review

Research consistently shows that teacher compliance and commitment are key determinants of effective science teaching and learning outcomes. Compliance refers to teachers' adherence to curriculum standards, appropriate use of scientific processes, effective pedagogical strategies, and sound assessment practices (Smith, 2018; Shulman, 1987). When instruction is aligned with established standards, it supports curricular coherence, instructional consistency, and equitable learning opportunities for students.

Teacher commitment, on the other hand, reflects intrinsic motivation, professional dedication, and sustained engagement in instructional improvement and student learning (Day et al., 2007; Jones, 2019). Studies have found that committed teachers are more likely to participate

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in professional development, engage in reflective practice, and implement innovative teaching strategies that enhance conceptual understanding in science (Hattie, 2012). Commitment thus strengthens the impact of compliance by translating policy and standards into meaningful classroom practice.

Further studies indicate that demographic and professional variables—such as age, sex, educational attainment, marital status, teaching experience, and participation in professional development—significantly influence teachers' levels of compliance and commitment (Ingersoll & Merrill, 2017; OECD, 2019). These factors affect teachers' readiness to implement reforms and sustain effective instructional practices. Understanding these relationships provides valuable insights for school leaders and policymakers to identify gaps, refine professional development programs, and design targeted interventions that strengthen teachers' compliance with standards and their commitment to high-quality science education.

Theoretical Underpinnings

This study is anchored on Ajzen's Theory of Planned Behavior (1991) and Meyer and Allen's Theory of Organizational Commitment (1991).

Ajzen's Theory of Planned Behavior (1991) suggests that teachers' compliance is influenced by their attitudes toward educational standards, perceived social pressure to conform (subjective norms), and their confidence in possessing the necessary skills and resources (perceived behavioral control). This theory helps explain why teachers may or may not adhere to prescribed science teaching guidelines. Meyer and Allen's Theory of Organizational Commitment (1991) highlights that teachers' dedication to their profession depends on affective commitment (personal attachment to teaching), continuance commitment (perceived costs of leaving the role), and normative commitment (sense of obligation to stay). This framework provides insight into variations in teachers' commitment to applying effective science pedagogy. Together, these theories provide a comprehensive framework for examining the relationships among compliance, commitment, and the difficulties encountered by science teachers, and they guide the development of targeted interventions to improve science education outcomes.

Objectives

This paper aimed to determine the extent of compliance and the level of commitment of teachers in teaching Science in Southern Negros, Negros Occidental Division, Philippines, during the School Year 2023-2024. Specifically, this study sought to answer the following questions: (1) What is the extent of compliance by teachers in teaching science in terms of the following areas? a. Science processes b. Appropriate Pedagogy c. Assessment of Learning (2). What is the level of commitment by teachers in teaching science according to the aforementioned areas? (3.) Is there a significant difference in the extent of compliance by Teachers in teaching science when grouped and compared according to the aforementioned variables? (4.) Is there a significant difference in the level of commitment by teachers in teaching science when grouped and compared according to the aforementioned variables? (5.) Is there a significant relationship

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between the extent of compliance and the level of commitment by teachers in teaching science when grouped and compared according to the aforementioned variables?

Methodology

The study's methodology-related components, such as the research design, respondents, research instrument, data collection process, and ethical issues, are described in this section.

Research Design

This study adopts a descriptive research design to determine the extent of compliance and the level of commitment of teachers in teaching Science in Southern Negros, Negros Occidental, Philippines, during the School Year 2023-2024. According to Dudovsky (2017), descriptive research design attempts to determine, describe, or identify characteristics within the field of investigation. The researcher believes that this design serves as the anchor and is necessary to achieve all the objectives of the researcher's study. Where it is the purpose of a study to present and describe a general picture of a prevailing condition or situation as it exists at a particular time, the most appropriate research design to use is descriptive research in the form of a self-made survey questionnaire.

Respondents

The respondents for this study comprise 285 teachers in Southern Negros under Negros Occidental Division. Since the number of respondents is quite manageable, total enumeration was employed.

Data-gathering Instrument

The instrument underwent rigorous face and content validation by five experts in research and education to ensure its accuracy in measuring the intended demographics. The validation process yielded a final validity score of 4.55, indicating excellent validity. Cronbach's Alpha was used to assess the instrument's reliability and internal consistency. For this study, the compliance reliability index is 0.970, interpreted as "excellent," the commitment reliability index is 0.982, interpreted as "excellent," and the difficulties' reliability index is 0.972, interpreted as "excellent," meaning the questionnaire is highly reliable.

Procedures for Data Collection

A letter of request was addressed to the Regional Director, requesting the conduct of the study within the District of Candoni, Negros Oriental Division. Upon approval, the request letter was distributed to the division's school head. After securing the approval for the second request, questionnaires were administered to target respondents.

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The researcher scheduled the administration of the research instrument to minimize inconvenience and ensure preparedness. The researcher administered the instrument personally to ensure the accuracy and completeness of the data. It was conducted via email and instant messaging.

The data gathered from the respondents' responses were tallied and tabulated using the appropriate statistical tools. The raw data were transformed into numerical codes using a coding manual. This allowed computer processing, statistical derivations, and tabular presentation. The Statistical Package for the Social Sciences (SPSS) was used to process the encoded data.

Data Analysis and Statistical Treatment

Objective 1 used the same analytical scheme and statistical tool to determine the extent of compliance by teachers in teaching science in terms of three (3) key areas, namely: (1) science processes, (2) appropriate pedagogy, and (3) assessment of learning. Objectives 2 used the same analytical scheme and statistical tool to determine the level of commitment among teachers to teaching science across the aforementioned areas. Objective 3 used the comparative analytical schemes and Mann-Whitney U tests as statistical tools to determine whether significant differences exist in the extent of compliance among teachers in teaching science when grouped and compared according to the aforementioned variables. Objective 4 used comparative analytical schemes and Mann-Whitney U tests as statistical tools to determine whether significant differences exist in teachers' commitment to teaching science across groups defined by the aforementioned variables. Objective 5 used comparative analytical schemes and Spearman's Rho as statistical tools to determine whether the relationship between the extent of compliance and teachers' level of commitment to teaching science was significant when grouped and compared according to the aforementioned variables.

Ethical Considerations

Significant ethical considerations were carefully adopted during the conduct of the research study to promote, protect, and respect the fundamental personal and constitutional rights of all respondent-participants to this undertaking, which included the two (2) basic protocols, thus: (a) informed consent. Respondents were to be made aware of the purpose of the study, making sure that the research work does no harm nor have any potential impact on them and that they can make an informed decision whether to participate or not because it is voluntary, hence free from any form of coercion; and (b) respondents must have thorough knowledge that the information or responses given should be treated with the utmost confidentiality and in any manner, exercise anonymity by strictly securing any information under the protection of data privacy such that the identity of the respondents remained unknown and that the responses and data gathered are used solely according to the purpose and intent of the research study.

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Results and Discussion

Extent of Compliance by Teachers in Teaching Science in Science Processes, Appropriate Pedagogy, and Assessment of Learning.

Table 1
Extent of Compliance by Teachers in Teaching Science in Science Processes

Items	Mean	Interpretation
As a teacher, I…		
1. effectively incorporate science processes into my teaching.	4.61	very great extent
2. Regularly emphasize the importance of scientific inquiry in my science lessons.	4.48	great extent
3. Integrate hands-on activities to promote understanding of science processes.	4.40	great extent
4. Consistently encourage students to question and explore scientific concepts.	4.50	very great extent
5. continuously seek ways to improve the application of science processes in my teaching.	4.57	very great extent
Overall Mean	**4.51**	**Very Great Extent**

Table 1 presents data on the extent of teachers' compliance with science processes. The respondents obtained an overall mean score of 4.51, interpreted as a very great extent. The results suggest that the respondents were less likely to integrate hands-on activities into their classroom science instruction. This is because some science learning activities require physical materials to provide learners with firsthand experience. One of the problems science teachers face in conducting hands-on science activities is the lack of and unavailability of instructional materials and equipment. Allowing students to explore scientific concepts through hands-on activities and experiments increases engagement and academic achievement. The result relates to that of Dorsah et al. (2024), wherein the causes for their lower compliance and challenges in integrating hands-on science activities were the lack of laboratories, a lack of laboratory apparatus and equipment, a lack of chemicals for performing simple science experiments, inadequate teaching and learning materials, and insufficient curriculum materials.

Table 2
Extent of Compliance by Teachers in Teaching Science in Appropriate Pedagogy

Items	Mean	Interpretation
As a teacher, I…		
1. Use appropriate teaching methods that align with science education best practices.	4.43	great extent
2. Adapt my teaching style to cater to the diverse learning needs of students in science.	4.35	great extent

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3. Employ innovative strategies to engage students in science lessons.	4.17	great extent
4. Regularly update and enhance my pedagogical skills in teaching science.	4.20	great extent
5. Foster a positive and inclusive learning environment for science education.	4.45	great extent
Overall Mean	**4.32**	**Great Extent**

Table 2 presents data on the extent of teachers' compliance with appropriate pedagogy in teaching science. The respondents obtained an overall mean score of 4.32, interpreted as a great extent. The result implies that the respondents were less enthusiastic about employing innovative strategies to engage students in science lessons. The reason is that some teachers lack confidence when teaching topics outside their area of expertise, which can make it difficult for them to prepare lesson plans, choose or devise activities and analogies to aid students' learning, answer students' questions, and link and apply various concepts and principles to everyday life situations. Additionally, teachers' limited pedagogical content knowledge contributed to their lack of confidence in employing innovative teaching strategies in science. The result relates to that of Parker et al. (2018), wherein inadequate background in subject knowledge is one of the main factors that contribute to such challenges and will have an impact on the development of the teachers' pedagogical content knowledge, as well as on the teachers' self-confidence and attitudes when teaching topics in integrated science.

Table 3
Extent of Compliance by Teachers in Teaching Science in the Assessment of Learning

Items	Mean	Interpretation
As a teacher, I…		
1. Conduct regular and practical assessments to gauge students' understanding of science concepts.	4.43	Great Extent
2. Provide Timely And Constructive Feedback To Students On Their Science Performance.	4.33	Great Extent
3. Utilize A Variety Of Assessment Methods To Comprehensively Evaluate Students' Science Skills.	4.26	Great Extent
4. Adjust My Teaching Strategies Based On The Outcomes Of Assessments In Science.	4.33	Great Extent
5. Actively Seek Professional Development Opportunities Related To Effective Science Assessment Practices.	4.18	Great Extent
Overall Mean	**4.31**	**Great Extent**

Table 3 presents data on the extent of teachers' compliance in teaching science, as assessed by learning outcomes. It revealed that the respondents obtained an overall mean score of 4.31, interpreted as a great extent. The results suggest that the respondents were actively seeking and engaging in professional development related to assessing learning practices in science. This is due to teachers' working conditions, in which most have a heavy teaching load and numerous ancillary responsibilities, hindering their ability to pursue professional

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development. In addition, time constraints, financial constraints, and the need to balance work responsibilities with personal commitments pose substantial obstacles to teachers' professional development, constraining their capacity to pursue valuable opportunities for personal growth and improvement. The result aligns with Morales (2023), who found that teachers often face significant challenges engaging in professional development due to busy schedules, limited time, and financial constraints.

Level of Commitment by Teachers in Teaching Science in Science Processes, Appropriate Pedagogy, and Assessment of Learning

Table 4
Level of Commitment by Teachers in Teaching Science in Science Processes

Items	Mean	Interpretation
As a teacher, I…		
1. Demonstrate a strong commitment to integrating science processes into my teaching.	4.62	Very High Level
2. Prioritize the incorporation of scientific inquiry skills in my science lessons.	4.48	High Level
3. Invest extra effort to ensure the practical application of science processes in my teaching.	4.42	High Level
4. Display a consistent dedication to fostering a culture of scientific exploration among students.	4.46	High Level
5. Continuously enhance my commitment to the principles of scientific processes in teaching.	4.54	Very High Level
Overall Mean	**4.50**	**Very High Level**

Table 4 presents data on teachers' level of commitment to teaching science processes. It had an overall mean of 4.50, indicating a very high level. The result suggests that some respondents were less committed to investing extra effort in their teaching to ensure the practical application of science processes. This is because there is a shortage of time allotted for science classes; hence, not all science concepts were introduced by the teachers in a variety of examples and hands-on applications. The result, as affirmed by Musharrat (2020), indicates that science teachers require sufficient time for preparation. Providing adequate instructions for conducting hands-on activities and allocating enough time and learning resources became a significant challenge in this case. Most of the time, teaching materials and aids were less relevant to activities in science classes. Students have the fewest chances to use materials for hands-on activities.

Table 5
Level of Commitment by Teachers in Teaching Science in Appropriate Pedagogy

Items	Mean	Interpretation
As a teacher, I…		

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1. Exhibit a strong commitment to using appropriate teaching methods aligned with science education best practices.	4.35	High Level
2. Show dedication to adapting my teaching style to cater to the diverse learning needs of students in science.	4.32	High Level
3. manifest a continuous commitment to employing innovative strategies for engaging students in science lessons.	4.21	High Level
4. Regularly update and enhance my commitment to pedagogical skills in teaching science.	4.19	High Level
5. consistently prioritize the creation of a positive and inclusive learning environment for science education.	4.38	High Level
Overall Mean	**4.29**	**High Level**

Table 5 presents data on teachers' level of commitment to teaching science using appropriate pedagogy. The results showed an overall mean score of 4.29, interpreted as a very high level. The result implies that the respondents were less committed to updating and enhancing their pedagogical skills in teaching science. Most teachers aspire to improve their pedagogical skills, which they achieve through attendance at training sessions, seminars, workshops, and enrollment in graduate programs, if given the opportunity. However, due to their busy schedules, limited time, and budget constraints, their ability to update and enhance their pedagogical skills was significantly affected. The result aligns with that of Ma (2022), who concluded that commitment is necessary for educators to become engaged in specific tasks and to develop a strong professional identity as teachers. It is expected that educators maintain their commitment to their profession, as the level of commitment plays a significant role in determining whether an educator can enjoy their education career or quit due to exhaustion and burnout.

Table 6

Level of Commitment by Teachers in Teaching Science in the Assessment of Learning

Items	Mean	Interpretation
As a teacher, I…		
1. Express a strong commitment to conducting regular and practical assessments in science.	4.39	High Level
2. Demonstrate dedication to providing timely and constructive feedback on students' science performance.	4.32	High Level
3. Manifest a continuous commitment to utilizing a variety of assessment methods for evaluating students' science skills.	4.25	High Level
4. Exhibit a commitment to adjusting teaching strategies based on the outcomes of science assessments.	4.27	High Level
5. display a commitment to actively seeking professional development opportunities related to effective science assessment practices.	4.22	High Level
Overall Mean	**4.29**	**High Level**

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Table 6 presents the data on the level of teacher commitment in teaching science, as assessed by learning outcomes. It obtained an overall mean of 4.29, interpreted as a high level. The result suggests that the respondents were less committed to seeking professional development opportunities in science assessment practices. This is because of increased professional development opportunities in science assessment practices that align with teachers' budget constraints. The result relates to that of Morales (2023). He revealed that, among the professional development challenges in terms of availability, cost, and design, respondents encountered limited opportunities that were suited to their budgets and relevant to their area of specialization.

Comparative Analysis in the Extent of Compliance by Teachers in Teaching Science in Science Processes, Appropriate Pedagogy, and Assessment of Learning when grouped according to Age, Sex, Highest Educational Attainment, Civil Status, and Number of Science-Related Training

Table 7
Difference in the Extent of Compliance by Teachers in Teaching Science in Science Processes when grouped according to Variables

Variable	Category	N	Mean Rank	Mann-Whitney U	p-value	*Sig. level*	Interpretation
Age	Younger	150	137.40	9246.000	0.194		Not Significant
	Older	135	149.51				
Sex	Male	79	138.99	7820.500	0.602		Not Significant
	Female	206	144.54				
Highest Educational Attainment	Lower	184	141.02	8928.000	0.575	0.05	Not Significant
	Higher	101	146.60				
Civil Status	Single	90	125.20	7173.000	0.011		Significant
	Married	195	151.22				
Number of Science-Related Learning	Few	178	133.30	7797.000	0.009		Significant
	Many	107	159.13				

Table 7 summarizes the computed p-values for the variables age, sex, and highest educational attainment: 0.194, 0.602, and 0.575, respectively, all of which exceed the 0.05 level of significance and are thus interpreted as not significant. Therefore, the hypothesis that there is no significant difference in the extent of teachers' compliance with science processes when grouped and compared by age, sex, and highest education attainment is accepted.

However, for variables civil status and number of science-related trainings, the computed p-values are 0.011 and 0.009, which are less than the 0.05 level of significance and thus interpreted as significant. Therefore, the hypothesis that there is no significant difference in the extent of compliance among teachers in teaching science processes when grouped and compared by civil status and the number of science-related trainings is rejected. The result implies that the extent of teachers' compliance with science processes varies by civil status and the number of

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science-related trainings, but not by age, sex, or highest educational attainment. This is because unmarried respondents with more training applied the scientific processes more effectively than their counterparts. Science process skills need to be developed in science learning because they help students develop their critical thinking skills, enabling them to discover and understand scientific concepts. The development of scientific skills enables students to solve daily problems. In their opinion, Zeitoun and Hajo (2015) state that science process skills are important indicators for students in solving problems. Therefore, students need to master science process skills.

Table 8
Difference in the Extent of Compliance by Teachers in Teaching Science in Appropriate Pedagogy when grouped according to Variables

Variable	Category	N	Mean Rank	Mann-Whitney U	p-value	*Sig. level*	Interpretation
Age	Younger	150	143.67	10025.000	0.884		Not Significant
	Older	135	142.26				
Sex	Male	79	158.44	6917.500	0.048		Significant
	Female	206	137.08				
Highest Educational Attainment	Lower	184	141.06	8934.500	0.587	0.05	Not Significant
	Higher	101	146.54				
Civil Status	Single	90	147.63	8358.000	0.514		Not Significant
	Married	195	140.86				
Number of Science-Related Learning	Few	178	135.61	8207.500	0.048		Significant
	Many	107	155.29				

Table 8 presents the computed p-values for the variables age, highest educational attainment, and civil status, which are 0.884, 0.587, and 0.514, respectively. All of these values are greater than the 0.05 level of significance and are thus interpreted as not significant. Therefore, the hypothesis that there is no significant difference in the extent of compliance by teachers in teaching science using appropriate pedagogy when grouped and compared according to age, highest level of education, and civil status is accepted. However, for the variables sex and number of science-related trainings, the computed p-values are both 0.048, which is less than the 0.05 level of significance and thus interpreted as significant. Therefore, the hypothesis that there is no significant difference in the extent of compliance by teachers in teaching science in appropriate pedagogy when grouped and compared according to sex and number of science-related trainings is rejected.

The results suggest that the extent of compliance of teachers in teaching science using the appropriate pedagogy varies according to sex and the number of science-related trainings, but not according to age, highest educational attainment, or civil status. This is because female respondents with many trainings exhibited better pedagogical skills in engaging learners' interest in all science learning activities. Teacher-pedagogical skills are a crucial element in efforts to

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improve the quality of learning. Teachers with superior pedagogical skills can create learning environments that are engaging, effective, and tailored to meet the needs of students (Archambault, Leary, & Rice, 2022). However, many teachers still lack adequate pedagogical skills. This highlights the need for greater attention to developing teachers' pedagogical skills, ensuring that each learning process runs optimally and meets students' learning needs more effectively.

Table 9
Difference in the Extent of Compliance by Teachers in Teaching Science in Assessment of Learning when grouped according to Variables

Variable	Category	N	Mean Rank	Mann-Whitney U	p-value	*Sig. level*	Interpretation
Age	Younger	150	141.82	9947.500	0.796		Not Significant
	Older	135	144.31				
Sex	Male	79	153.58	7301.000	0.175		Not Significant
	Female	206	138.94				
Highest Educational Attainment	Lower	184	140.37	8808.000	0.462	0.05	Not Significant
	Higher	101	147.79				
Civil Status	Single	90	142.40	8721.000	0.933		Not Significant
	Married	195	143.28				
Number of Science-Related Learning	Few	178	134.69	8043.500	0.026		Significant
	Many	107	156.83				

Table 9 presents the computed p-values for the variables age, sex, highest educational attainment, and civil status, which are 0.796, 0.175, 0.462, and 0.993, respectively. All of these values are greater than the 0.05 level of significance and are thus interpreted as not significant. Therefore, the hypothesis that there is no significant difference in the extent of compliance by teachers in teaching science in assessment of learning when grouped and compared according to age, sex, highest level of education attained, and civil status is accepted. However, for the number of science-related trainings, the computed p-value is 0.026, which is less than the 0.05 level of significance and thus interpreted as significant. Therefore, the hypothesis that there is no significant difference in the extent of compliance by teachers in teaching science in the assessment of learning when grouped and compared according to the number of science-related trainings is rejected.

The result implies that the extent of compliance by teachers in teaching science, as assessed by learning outcomes, varies in relation to the number of science-related trainings. This is because respondents had successfully applied the training they received in their science assessment activities. Thus, implementing professional development on assessment for learning could be seen as an alternative to impacting teachers' practice and ultimately affecting student success. However, it was found that science teachers who attended more science-related trainings

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exhibited different assessment strategies, indicating the importance of such seminars and trainings in enhancing professional development during these times. According to Kelly (2019), training provides teachers with the best chance of success and helps senior teachers stay on track as they face new challenges in the classroom. There is a risk that instructors will leave the profession early if this training is not provided. Because many of these trainings and seminars are available for free, teachers should take advantage of these possibilities for self-improvement and professional growth.

Comparative Analysis in the Level of Commitment by Teachers in Teaching Science in Science Processes, Appropriate Pedagogy, and Assessment of Learning when grouped and compared according to Age, Sex, Highest Educational Attainment, Civil Status, and Number of Science Related Training

Table 10
Difference in the Level of Commitment by Teachers in Teaching Science in Science Processes when grouped according to Variables

Variable	Category	N	Mean Rank	Mann-Whitney U	p-value	*Sig. level*	Interpretation
Age	Younger	150	146.62	9581.500	0.422	0.05	Not Significant
	Older	135	138.97				
Sex	Male	79	152.56	7328.000	0.214		Not Significant
	Female	206	139.33				
Highest Educational Attainment	Lower	184	144.60	8997.500	0.650		Not Significant
	Higher	101	140.08				
Civil Status	Single	90	150.66	8085.500	0.274		Not Significant
	Married	195	139.46				
Number of Science-Related Learning	Few	178	134.20	7956.000	0.017		Significant
	Many	107	157.64				

Table 10 presents the computed p-values for the variables age, sex, highest educational attainment, and civil status, which are 0.422, 0.214, 0.560, and 0.274, respectively. All of these values are greater than the 0.05 level of significance and are thus interpreted as not significant. Therefore, the hypothesis that there is no significant difference in the level of commitment by teachers to teaching science in science processes when grouped and compared according to age, sex, highest level of education attained, and civil status is accepted. However, for the number of science-related trainings, the computed p-value is 0.017, which is less than the 0.05 level of significance and thus interpreted as significant. Therefore, the hypothesis that there is no significant difference in the level of commitment by teachers to teaching science in science processes when grouped and compared according to the number of science-related trainings is rejected.

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The result implies that the level of commitment of teachers to teaching science processes varies compared to the number of science-related trainings. This is because respondents had successfully applied the training they received in their science assessment activities. Teachers with more training demonstrated better proficiency in science processes compared to their counterparts. Teachers' proficiency level and understanding of science processes are also key factor that determines the acquisition of science process skills by students. High-level teachers' understanding of these skills leads to effective, efficient, and quality implementation of science education at any level. Teachers' attitude towards the science education curriculum and their performance on science processes are helpful for the development of science process skills among their students (Gizaw, 2023).

Table 11
Difference in the Level of Commitment by Teachers in Teaching Science in Appropriate Pedagogy when grouped according to Variables

Variable	Category	N	Mean Rank	Mann-Whitney U	p-value	*Sig. level*	Interpretation
Age	Younger	150	150.32	9027.000	0.109		Not Significant
	Older	135	134.87				
Sex	Male	79	156.78	7048.500	0.077		Not Significant
	Female	206	137.72				
Highest Educational Attainment	Lower	184	145.09	8909.000	0.559	0.05	Not Significant
	Higher	101	139.20				
Civil Status	Single	90	143.94	8690.500	0.895		Not Significant
	Married	195	142.57				
Number of Science-Related Learning	Few	178	141.24	9210.500	0.639		Not Significant
	Many	107	145.92				

Table 11 presents the computed p-values for variables age, sex, highest educational attainment, civil status, and number of science-related trainings, which are 0.109, 0.077, 0.559, 0.895, and 0.639, respectively. All of these values are greater than the 0.05 level of significance and are thus interpreted as not significant. Therefore, the hypothesis that there is no significant difference in the level of commitment by teachers to teaching science in appropriate pedagogy when grouped and compared according to age, sex, highest level of education attained, civil status, and number of science-related trainings is accepted.

This implies that the level of commitment by teachers to teaching science in an appropriate pedagogy, when compared according to age, sex, highest educational attainment, civil status, and number of science-related trainings, does not vary. Regardless of their profile background, they showed great dedication to teaching science. According to Negassa & Engdasew (2017), training in pedagogical skills affects how teachers utilize lesson planning, active learning techniques, continuous assessment methods, and classroom management.

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Teachers highlighted the beneficial effects of such training on their teaching practices while also noting challenges such as redundant concepts, activities, and examples; modules that fail to meet standards; lengthy training sessions; large class sizes; inadequate materials and facilities; a lack of motivation; and difficulties in fully implementing what they learned from the training.

Table 12
Difference in the Level of Commitment by Teachers in Teaching Science in Assessment of Learning when grouped according to variables

Variable	Category	N	Mean Rank	Mann-Whitney U	p-value	*Sig. level*	Interpretation
Age	Younger	150	148.52	9297.000	0.228		Not Significant
	Older	135	136.87				
Sex	Male	79	149.18	7648.500	0.427		Not Significant
	Female	206	140.63				
Highest Educational Attainment	Lower	184	134.71	7767.500	0.020	0.05	Significant
	Higher	101	158.09				
Civil Status	Single	90	134.88	8044.500	0.253		Not Significant
	Married	195	146.75				
Number of Science-Related Learning	Few	178	139.01	8813.500	0.286		Not Significant
	Many	107	149.63				

Table 12 presents the computed p-values for the variables age, sex, civil status, and number of science-related trainings, which are 0.228, 0.427, 0.253, and 0.286, respectively. All of these values are greater than the 0.05 level of significance and are thus interpreted as not significant. Therefore, the hypothesis that there is no significant difference in the level of commitment by teachers in teaching science in assessment of learning when grouped and compared according to age, sex, civil status, and number of science-related trainings is accepted. However, for the variable highest educational attainment, the computed p-value is 0.020, which is less than the 0.05 level of significance and thus interpreted as significant. Therefore, the hypothesis that there is no significant difference in the level of commitment by teachers in teaching science in the assessment of learning when grouped and compared according to the highest educational attainment is rejected.

The results imply that the level of commitment of teachers in teaching science, as assessed by their learning, varies according to their highest level of educational attainment. This is because respondents with higher educational attainment, particularly those holding master's and doctoral degrees, were significantly more knowledgeable and experienced in various assessment strategies. Teachers develop as professionals through their long-term and day-to-day work, which is why job-embedded learning opportunities should be at the core of all professional development initiatives.

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Correlational Analysis between the Extent of Compliance and the Level of Commitment of the Teachers in Teaching Science

Table 13

Relationship Between the Extent of Compliance and the Level of Commitment of the Teachers in Teaching Science

Variable	Rho	p-value	*Sig. level*	Interpretation
Extent of Compliance Level of Commitment	0.399	0.000	0.01	Significant

Table 13 presents the correlational analysis between the extent of compliance and the level of commitment of teachers to teaching science. The computed rho is 0.399 with a p-value of 0.000, which is less than the 0.05 level of significance and thus interpreted as significant. Thus, the hypothesis that there is no significant relationship between the extent of compliance and the level of commitment of teachers to teaching science is rejected. The results suggest that the level of compliance of science teachers in teaching science has a significant influence on their commitment to professional development. Science teachers are compliant with teaching duties according to their personal capability, knowledge, skills, values, and determination within a working environment, which influences their teaching commitment.

Conclusion

Based on the findings of the study, it is concluded that Science teachers in Southern Negros under the Negros Occidental Division demonstrate a high to very high extent of compliance with science teaching standards and a high level of commitment to science instruction. Teachers consistently adhere to prescribed practices in science processes, appropriate pedagogy, and assessment of learning, indicating strong alignment with established science education standards and instructional expectations.

The results further reveal that teachers' demographic characteristics partially influence their compliance and commitment to teaching science. Specifically, civil status and the number of science-related trainings significantly affect teachers' compliance in science processes, while sex and training exposure influence compliance in appropriate pedagogy. Likewise, the level of commitment in science processes is significantly associated with the number of science-related trainings, and commitment in assessment of learning varies significantly according to teachers' highest educational attainment. These findings suggest that professional preparation and continuous learning play a critical role in strengthening both compliance and commitment among Science teachers.

Moreover, the study establishes a significant positive relationship between the extent of compliance and the level of commitment of teachers in teaching science. This indicates that teachers who consistently comply with science teaching standards are more likely to exhibit stronger commitment to their instructional roles. The findings affirm that enhancing teachers' professional competencies and sustaining their adherence to instructional standards contribute to increased commitment and effectiveness in science teaching. These results underscore the importance of continuous professional development and institutional support in promoting

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quality science education.

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Conflict of Interest

The author declares the absence of any conflict of interest that could have influenced the content or conclusions of this paper. He affirms that no financial, personal, or professional relationships with other individuals or organizations have compromised the objectivity, integrity, or impartiality of the research work. As a final point, no external parties influenced the study design, data collection, analysis, or interpretation.

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