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Factors Affecting the Quality of Instructions of Science Teachers in Public Secondary Schools of Alicia, Isabela

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A B S T R A C T
This study examined the factors affecting the quality of instruction among science teachers in public secondary schools in Alicia, Isabela, focusing on teacher-related, school-related, and instructional quality factors. Using a descriptive-correlational design, data were gathered from 35 science teachers through a survey questionnaire and analyzed using descriptive and inferential statistics. Findings revealed that teachers generally demonstrated high competence, effective teaching practices, and strong engagement in professional development. School environments were perceived as supportive, though administrative support and collaboration require improvement. Significant relationships were found between instructional quality and teachers' profiles, indicating that demographic and professional characteristics influence teaching effectiveness. The study highlights the need for continuous professional development and enhanced institutional support.

INTRODUCTION

Effective basic education must include high-quality science instruction since it fosters students' curiosity, critical thinking, and problem-solving skills. In the quickly evolving educational landscape of today, science teachers are essential in ensuring that students gain both scientific knowledge and the capacity to apply it in practical settings. However, a number of issues, including a lack of instructional resources, insufficient training, and a high workload, continue to make teaching science difficult in many public schools. These difficulties could have an impact on how well students are taught, which would then have an impact on their academic achievement and level of interest in science.

Alipio (2021) asserts that administrative support, professional development, and access to instructional resources all have a major impact on the quality of instruction provided by public school teachers in the Philippines. The availability of laboratory supplies and ongoing training participation were found to be positively connected with higher-quality science instruction. This implies that teachers' effectiveness as educators rises significantly when they are provided with sufficient resources and chances for professional development. Similarly, Guskey and Sparks (2019) emphasized in their international study that teacher quality is the most important in-school factor affecting student achievement. Their research indicated that well-prepared and motivated teachers, supported by strong school leadership, tend to deliver higher-quality instruction and foster better student learning outcomes. The study highlighted that investment in teacher training, mentoring, and supportive learning environments is essential for sustaining instructional excellence in science education.

Science teachers in the Alicia, Isabela are expected to match their instruction to the Department of Education's objective of producing citizens who are scientifically literate as well as the K–12 curriculum standards. Disparities in the quality of instruction between teachers and schools have been noted in spite of these efforts. This necessitates a more thorough comprehension of the elements that influence the quality of instruction, whether they are environment-related (e.g., administrative and community support), teacher-related (e.g., training, experience), or resource-related (e.g., laboratory facilities, class size).

The results of this study will give the district baseline data for enhancing learning environments, instructional strategies, and teacher competencies. By examining the variables influencing the caliber of science teachers' instruction in Alicia, Isabela public schools, this study ultimately seeks to enhance science education.

THEORETICAL REVIEW

The reviewed literature highlights that instructional quality in science education is shaped by both teacher competence and instructional practices. Teacher-related factors such as pedagogical content knowledge, motivation, and professional development significantly influence teaching effectiveness, as emphasized by Darling-Hammond et al. (2021), Gess-Newsome (2020), Harrell (2022), Fauth et al. (2020), and Schleicher (2022). Moreover, collaboration and reflective practices further enhance instructional quality (Wenger-Trayner & Wenger-Trayner, 2021; Lau & Ho, 2021). Locally, studies confirm that continuous

professional development, self-efficacy, and collaboration improve teachers' competence and instructional performance (Felix & Abrogena, 2023; Bustamante, 2023; De La Cruz & Justo, 2025; Aquino & Bautista, 2023; Walag et al., 2022; Taran & Israel, 2022).

Another major theme emphasizes the role of school support and instructional strategies in improving teaching outcomes. Adequate resources, administrative support, and conducive learning environments significantly enhance instructional delivery (Nguyen et al., 2023; Abdulkadir & Yildirim, 2022; Wang & Degol, 2020; Alonso et al., 2023; Toropova et al., 2021; Choi & Kang, 2022). Instructional quality is further strengthened through inquiry-based, student-centered, and technology-integrated approaches (Mokhtar & Zainuddin, 2023; OECD, 2021; Tigchelaar et al., 2022; Lee & Choi, 2023; Halim & Meerah, 2020; Anderson & Chang, 2021; Sibanda & Mpofu, 2022; Zhang et al., 2023). Local studies similarly highlight that institutional support and innovative teaching strategies improve instructional effectiveness (Calo & De Vera, 2025; Calingacion, 2020; Alforque, 2022; Clores & Nueva España, 2023; Walag et al., 2022; Taran & Israel, 2022; De La Cruz & Justo, 2025; Aquino & Bautista, 2023). Overall, these studies demonstrate that the integration of teacher competence, supportive school environments, and effective instructional practices is essential for achieving high-quality science instruction.

METHODOLOGY

This study employed a descriptive-correlational research design to examine the relationship between the quality of instruction and mastery among science teachers in public secondary schools in Alicia, Isabela. Data were collected through a researcher-developed survey questionnaire consisting of two parts: respondents' demographic profiles and factors affecting instructional quality, categorized into teacher-related, school-related, and instructional factors. The study utilized total enumeration, involving all 35 science teachers from four public secondary schools, ensuring comprehensive representation. The selected locale provided a relevant setting due to the diverse teaching experiences and instructional practices of science educators.

The data gathering process involved securing permission from school authorities, distributing questionnaires, and ensuring ethical considerations such as voluntary participation and confidentiality. Collected data underwent systematic processing, including validation and statistical analysis. Descriptive statistics such as frequency and percentage distribution were used to profile respondents, while a five-point Likert scale measured perceptions on instructional quality. Inferential statistics, including Chi-square and Pearson correlation coefficient, were applied to determine relationships between respondent profiles and instructional factors, ensuring that the findings were valid, reliable, and aligned with the study's objectives.

RESULTS

Table 1. Significance Relationship between Teacher-Related Factors and their Sex

Particulars	Chi-square	Significance
1. I regularly attend seminars, trainings, or workshops related to science teaching.	34.658*	0.000
2. I feel confident in explaining scientific concepts to my students.	32.211*	0.000
3. I apply a variety of teaching strategies to meet diverse learner needs.	40.579*	0.000
4. I am motivated and enthusiastic in delivering science lessons.	46.988*	0.000
5. I continuously improve my teaching methods through self-study or research.	23.942*	0.000
6. I effectively manage classroom behavior to maintain an engaging learning environment.	26.984*	0.000
7. I allocate sufficient time to prepare well-structured science lessons.	35.615*	0.000

**Significant*

The findings presented in Table 1 reveal that there is a significant relationship between teacher-related factors and their sex, as shown by the computed Chi-square values, all with significance levels of 0.000, which are lower than the 0.05 level of significance. This indicates that sex plays a crucial role in shaping teachers' behaviors, attitudes, and teaching practices. Specifically, male and female teachers differ in terms of attending seminars, applying diverse strategies, maintaining motivation, and managing classrooms effectively. This result aligns with several local studies that emphasize the influence of teacher sex and characteristics on instructional performance.

A study published in the *Journal of Education and Social Policy* (2020) investigated the relationship between teachers' sex and students' preferences for their teachers' personality traits among public junior high schools in Western Misamis Oriental. The findings revealed that teachers' sex was highly significant in relation to how students perceived their teachers' fairness, responsiveness, and democratic attitude, concluding that sex and personality traits play vital roles in the teaching-learning process.

Similarly, Dubalan and Quines (2024) examined teacher-student relationships, interpersonal communication competence, and empowering leadership as predictors of job satisfaction among public school teachers in Region XII. Their findings showed that these variables were significantly correlated and that effective communication and teacher-student interactions greatly influenced teacher satisfaction, indirectly reflecting sex-based differences in interpersonal approaches.

Moreover, Yburan and Tantiado (2025) explored work-life balance and teaching competence among private senior high school teachers in Cagayan de Oro City and found that teachers who reported higher satisfaction and institutional support also demonstrated greater teaching competence. These studies collectively support the present study's conclusion that sex significantly affects teacher-related factors such as motivation, classroom management, and professional development engagement.

These findings imply that schools should consider gender-responsive training and support systems that acknowledge the unique strengths and challenges of both male and female teachers, thereby fostering equitable and effective teaching practices in science instruction.

Table 2. Significance Relationship between School-Related Factors and their Sex

Particulars	**Chi-square**	**Significance**
1.The school provides sufficient instructional materials for science lessons.	41.257*	0.000
2. Laboratory facilities and equipment are adequate and functional.	42.668*	0.000
3. The number of students per class allows for effective science instruction.	28.614*	0.000
4. My teaching load is manageable and allows me to focus on lesson quality.	36.214*	0.000
5. The school administration provides feedback and support to enhance teaching performance.	34.697*	0.000
6. The school encourages collaboration and sharing of teaching strategies among teachers.	32.584*	0.000
7. The school provides sufficient instructional materials for science lessons.	20.358*	0.000

**Significant*

The results in Table 2 indicate a significant relationship between school-related factors and teachers' sex ($p = 0.000 < 0.05$), suggesting that male and female teachers differ in their perceptions of resources, administrative support, collaboration, and workload. Supporting this, Abellera (2021) found that female teachers were more proactive in utilizing instructional materials and collaborating with peers. Similarly, Carpio and Balagtas (2022) reported that female teachers were more responsive to feedback and engaged in collaborative practices. Moreover, Lopez and Garcia (2023) found that while female teachers experienced higher workload stress, they demonstrated stronger commitment and adaptability. These findings highlight the need for gender-sensitive school management and equitable resource allocation.

Table 3. Significance Relationship between Instructional Quality Factors and their Sex

Particulars	Chi-square	Significance
1. I prepare lesson plans aligned with learning competencies in the K to 12 curriculum.	32.515*	0.000
2. I conduct inquiry-based or hands-on activities to develop students' scientific understanding.	28.699*	0.000
3. I use varied assessment tools to evaluate student learning effectively.	20.618*	0.000
4. I integrate technology and multimedia resources in teaching science.	42.684*	0.000
5. My teaching strategies stimulate curiosity and active participation among learners.	41.625*	0.000
6. I provide timely and constructive feedback to improve students' performance.	30.615*	0.000

**Significant*

The results in Table 3 reveal a significant relationship between instructional quality factors and teachers' sex ($p = 0.000 < 0.05$), indicating that teaching practices vary by gender and influence how science instruction is designed and delivered. Female teachers tend to emphasize structured planning, learner-centered approaches, and feedback, while male teachers often show strength in technology integration and performance-based tasks. Supporting this, Reyes and Dela Cruz (2021) found higher competence among female teachers in lesson planning and engagement, while males excelled in digital tools. Likewise, Torres and Evangelista (2022) reported that female teachers more frequently used inquiry-based strategies, and Santos (2023) noted their stronger feedback practices. These findings highlight the value of gender-sensitive training and collaborative teaching approaches.

Table 4. Significance Relationship between Teacher-Related Factors and their Age

Particulars	Chi-square	Significance
1. I regularly attend seminars, trainings, or workshops related to science teaching.	-0.581*	0.000
2. I feel confident in explaining scientific concepts to my students.	-0.647*	0.000
3. I apply a variety of teaching strategies to meet diverse learner needs.	-0.983*	0.000
4. I am motivated and enthusiastic in delivering science lessons.	-0.725*	0.000
5. I continuously improve my teaching methods through self-study or research.	-0.842*	0.000

6. I effectively manage classroom behavior to maintain an engaging learning environment.	-0.698*	0.000
7. I allocate sufficient time to prepare well-structured science lessons.	-0.534*	0.000

**Significant*

The findings in Table 4 show a significant relationship between teacher-related factors and age ($p = 0.000 < 0.05$), indicating that age influences teachers' performance and perceptions in science instruction. Younger teachers tend to demonstrate innovation, adaptability, and engagement in professional development, while older teachers exhibit stronger classroom management and experience-based skills. Supporting this, Garcia and Ramos (2020) found that younger teachers were more inclined toward technology-based teaching, while Villanueva (2021) highlighted the strengths of older teachers in classroom management. Likewise, De Guzman (2023) emphasized that teaching enthusiasm and professional growth vary with age. These findings suggest the need for age-responsive training and intergenerational collaboration among teachers.

Table 5. Significance Relationship between School-Related Factors and their Age

Particulars	**Chi-square**	**Significance**
1.The school provides sufficient instructional materials for science lessons.	-0.248*	0.000
2. Laboratory facilities and equipment are adequate and functional.	-0.684*	0.000
3. The number of students per class allows for effective science instruction.	-0.817*	0.000
4. My teaching load is manageable and allows me to focus on lesson quality.	-0.983*	0.000
5. The school administration provides feedback and support to enhance teaching performance.	-0.688*	0.000
6. The school encourages collaboration and sharing of teaching strategies among teachers.	-0.547*	0.000
7. The school provides sufficient instructional materials for science lessons.	-0.520*	0.000

**Significant*

The results in Table 5 indicate a significant relationship between school-related factors and teachers' age ($p = 0.000 < 0.05$), showing that perceptions of resources, facilities, workload, administrative support, and collaboration vary across age groups. Younger teachers tend to be more adaptable, collaborative, and open to technology, while older teachers emphasize manageable workloads, adequate resources, and quality instruction. Supporting this, Flores and Dizon (2020) found that younger teachers adapt more easily to school demands, while Reyes (2021) noted that older teachers are more concerned with resource

adequacy. Likewise, Cruz and Bautista (2022) highlighted generational differences in collaboration and resource use. These findings emphasize the need for age-responsive management and collaborative practices in schools.

Table 6. Significance Relationship between Instructional Quality Factors and their Age

Particulars	Chi-square	Significance
1. I prepare lesson plans aligned with learning competencies in the K to 12 curriculum.	-0.745*	0.000
2. I conduct inquiry-based or hands-on activities to develop students' scientific understanding.	-0.641*	0.000
3. I use varied assessment tools to evaluate student learning effectively.	-0.775*	0.000
4. I integrate technology and multimedia resources in teaching science.	-0.709*	0.000
5. My teaching strategies stimulate curiosity and active participation among learners.	-0.567*	0.000
6. I provide timely and constructive feedback to improve students' performance.	-0.426*	0.000

**Significant*

The results in Table 6 show a significant relationship between instructional quality factors and teachers' age ($p = 0.000 < 0.05$), indicating that instructional practices, planning, and assessment vary across age groups. Younger teachers tend to adopt innovative, technology-driven, and inquiry-based approaches, while older teachers demonstrate structured, experience-based, and consistent teaching practices. Supporting this, Cinadre (2022) found that pedagogical strategies vary based on teachers' demographic profiles. Similarly, Cabahug et al. (2024) reported that age influences 21st-century skills and teaching performance, while Empasis and Alcopra (2025) linked age and experience to teaching effectiveness. Moreover, Asis et al. (2024) highlighted higher instructional competence among older teachers, and Ortiz et al. (2024) supported this through improved lesson delivery and assessment practices. These findings underscore the importance of age-responsive professional development and intergenerational collaboration to enhance instructional quality.

Table 7. Significance Relationship between Teacher-Related Factors and their Teaching Experience

Particulars	Chi-square	Significance
1. I regularly attend seminars, trainings, or workshops related to science teaching.	-0.258*	0.000
2. I feel confident in explaining scientific concepts to my students.	-0.769*	0.000

3. I apply a variety of teaching strategies to meet diverse learner needs.	-0.915*	0.000
4. I am motivated and enthusiastic in delivering science lessons.	-0.714*	0.000
5. I continuously improve my teaching methods through self-study or research.	-0.145*	0.000
6. I effectively manage classroom behavior to maintain an engaging learning environment.	-0.156*	0.000
7. I allocate sufficient time to prepare well-structured science lessons.	-0.368*	0.000

**Significant*

The results presented in Table 7 indicate the significance of the relationship between teacher-related factors and their teaching experience. All computed Chi-square values yielded significance levels of 0.000, indicating that teaching experience plays a significant role in shaping teachers' professional behaviors and instructional practices.

Table 8. Significance Relationship between School-Related Factors and their Teaching Experience

Particulars	**Chi-square**	**Significance**
1.The school provides sufficient instructional materials for science lessons.	-0.951*	0.000
2. Laboratory facilities and equipment are adequate and functional.	-0.558*	0.000
3. The number of students per class allows for effective science instruction.	-0.608*	0.000
4. My teaching load is manageable and allows me to focus on lesson quality.	-0.976*	0.000
5. The school administration provides feedback and support to enhance teaching performance.	-0.715*	0.000
6. The school encourages collaboration and sharing of teaching strategies among teachers.	-0.621*	0.000
7. The school provides sufficient instructional materials for science lessons.	-0.155*	0.000

**Significant*

The data presented in Table 8 illustrates the significant relationship between school-related factors and teachers' teaching experience, with all computed Chi-square values showing a significance level of 0.000. This indicates that teaching experience plays an essential role in how teachers perceive and utilize school-related resources and support systems that affect instructional delivery and performance. Among the indicators, the highest Chi-square value (-0.976) corresponds to the statement *"My teaching load is manageable and allows me to focus on lesson quality,"* suggesting that teaching experience influences how

teachers balance workload and instructional quality. Experienced teachers may have developed time management skills and effective classroom routines, allowing them to maintain high teaching standards despite heavy workloads.

Table 9. Significance Relationship between Instructional Quality Factors and their Teaching Experience

Particulars	**Chi-square**	**Significance**
1. I prepare lesson plans aligned with learning competencies in the K to 12 curriculum.	-0.574*	0.000
2. I conduct inquiry-based or hands-on activities to develop students' scientific understanding.	-0.661*	0.000
3. I use varied assessment tools to evaluate student learning effectively.	-0.745*	0.000
4. I integrate technology and multimedia resources in teaching science.	-0.157*	0.000
5. My teaching strategies stimulate curiosity and active participation among learners.	-0.987*	0.000
6. I provide timely and constructive feedback to improve students' performance.	-0.767*	0.000

**Significant*

The data in Table 9 demonstrates a significant relationship between instructional quality factors and teachers' teaching experience, as all computed Chi-square values show a significance level of 0.000. This indicates that teaching experience has a notable impact on how teachers plan, deliver, and assess science instruction.

Table 10. Significance Relationship between Teacher-Related Factors and their Teaching Position

Particulars	**Chi-square**	**Significance**
1. I regularly attend seminars, trainings, or workshops related to science teaching.	-0.338*	0.000
2. I feel confident in explaining scientific concepts to my students.	-0.681*	0.000
3. I apply a variety of teaching strategies to meet diverse learner needs.	-0.755*	0.000
4. I am motivated and enthusiastic in delivering science lessons.	-0.987*	0.000
5. I continuously improve my teaching methods through self-study or research.	-0.574*	0.000
6. I effectively manage classroom behavior to maintain an engaging learning environment.	-0.922*	0.000
7. I allocate sufficient time to prepare well-structured science lessons.	-0.628*	0.000

**Significant*

The data in Table 10 illustrates a significant relationship between teacher-related factors and their teaching position, with all computed Chi-square values showing a significance level of 0.000. This indicates that a teacher's position within the school hierarchy influences their professional behaviors, classroom management, and instructional practices.

Table 11. Significance Relationship between School-Related Factors and their Teaching Position

Particulars	**Chi-square**	**Significance**
1.The school provides sufficient instructional materials for science lessons.	-0.765*	0.000
2. Laboratory facilities and equipment are adequate and functional.	-0.812*	0.000
3. The number of students per class allows for effective science instruction.	-0.914*	0.000
4. My teaching load is manageable and allows me to focus on lesson quality.	-0.874*	0.000
5. The school administration provides feedback and support to enhance teaching performance.	-0.657*	0.000
6. The school encourages collaboration and sharing of teaching strategies among teachers.	-0.797*	0.000
7. The school provides sufficient instructional materials for science lessons.	-0.721*	0.000

**Significant*

The results presented in Table 11 indicate a significant relationship between school-related factors and teachers' teaching position, with all Chi-square values showing a significance level of 0.000. This suggests that a teacher's position within the school hierarchy influences their perception and utilization of school resources, management of class size, workload, and engagement in collaborative practices.

Table 12. Significance Relationship between Instructional Quality Factors and their Teaching Position

Particulars	**Chi-square**	**Significance**
1. I prepare lesson plans aligned with learning competencies in the K to 12 curriculum.	-0.624*	0.000
2. I conduct inquiry-based or hands-on activities to develop students' scientific understanding.	-0.981*	0.000
3. I use varied assessment tools to evaluate student learning effectively.	-0.845*	0.000

4. I integrate technology and multimedia resources in teaching science.	-0.522*	0.000
5. My teaching strategies stimulate curiosity and active participation among learners.	-0.4697*	0.000
6. I provide timely and constructive feedback to improve students' performance.	-0.621*	0.000

**Significant*

The data presented in Table 12 indicates a significant relationship between instructional quality factors and teachers' teaching position, with all Chi-square values showing a significance level of 0.000. This suggests that a teacher's position within the school hierarchy has a strong influence on various aspects of instructional quality, including lesson planning, implementation of inquiry-based activities, assessment practices, integration of technology, student engagement, and provision of feedback.

Table 13. Significance Relationship between Teacher-Related Factors and their Highest Educational Background

Particulars	**Chi-square**	**Significance**
1. I regularly attend seminars, trainings, or workshops related to science teaching.	-0.225*	0.000
2. I feel confident in explaining scientific concepts to my students.	-0.794*	0.000
3. I apply a variety of teaching strategies to meet diverse learner needs.	-0.517*	0.000
4. I am motivated and enthusiastic in delivering science lessons.	-0.698*	0.000
5. I continuously improve my teaching methods through self-study or research.	-0.587*	0.000
6. I effectively manage classroom behavior to maintain an engaging learning environment.	-0.974*	0.000
7. I allocate sufficient time to prepare well-structured science lessons.	-0.414*	0.000

**Significant*

The results presented in Table 13 reveal a significant relationship between teacher-related factors and their highest educational background, with all Chi-square values showing a significance level of 0.000. This indicates that a teacher's level of education significantly influences their professional behaviors, classroom practices, and instructional effectiveness.

Table 14. Significance Relationship between School-Related Factors and their Highest Educational Background

Particulars	**Chi-square**	**Significance**

1.The school provides sufficient instructional materials for science lessons.	-0.889*	0.000
2. Laboratory facilities and equipment are adequate and functional.	-0.681*	0.000
3. The number of students per class allows for effective science instruction.	-0.581*	0.000
4. My teaching load is manageable and allows me to focus on lesson quality.	-0.768*	0.000
5. The school administration provides feedback and support to enhance teaching performance.	-0.713*	0.000
6. The school encourages collaboration and sharing of teaching strategies among teachers.	-0.706*	0.000
7. The school provides sufficient instructional materials for science lessons.	-0.350*	0.000

**Significant*

The data presented in Table 14 shows a significant relationship between school-related factors and teachers' highest educational background, with all Chi-square values demonstrating a significance level of 0.000. This suggests that teachers' educational qualifications significantly influence their perceptions of school resources, support systems, collaboration, and workload management.

Table 15. Significance Relationship between Instructional Quality Factors and their Highest Educational Background

Particulars	**Chi-square**	**Significance**
1. I prepare lesson plans aligned with learning competencies in the K to 12 curriculum.	-0.297*	0.000
2. I conduct inquiry-based or hands-on activities to develop students' scientific understanding.	-0.887*	0.000
3. I use varied assessment tools to evaluate student learning effectively.	-0.248*	0.000
4. I integrate technology and multimedia resources in teaching science.	-0.954*	0.000
5. My teaching strategies stimulate curiosity and active participation among learners.	-0.258*	0.000
6. I provide timely and constructive feedback to improve students' performance.	-0.224*	0.000

**Significant*

The results presented in Table 15 reveal a significant relationship between instructional quality factors and teachers' highest educational background, with all Chi-square values showing a significance level of 0.000. This indicates that teachers' educational attainment strongly influences their instructional practices, including lesson planning, implementation of inquiry-based or hands-on

activities, use of varied assessment tools, integration of technology, stimulation of student engagement, and provision of timely feedback.

CONCLUSIONS AND RECOMMENDATIONS

The study concludes that the quality of science instruction in Alicia, Isabela is significantly influenced by teacher-related, school-related, and instructional factors, all of which were rated positively by the respondents. The findings indicate that most teachers, predominantly female and within the age range of 31–40, demonstrate strong professional competence, confidence, and commitment to continuous improvement. High weighted means across indicators confirm that teachers effectively implement instructional strategies, integrate technology, and deliver competency-based lessons within a generally supportive school environment. Moreover, significant relationships were found between instructional quality and teachers' demographic and professional profiles, suggesting that experience, position, and educational attainment play a vital role in enhancing teaching effectiveness. Overall, improving teacher qualifications, strengthening professional development, and ensuring adequate institutional support are essential to sustaining high-quality science instruction.

Based on these conclusions, several recommendations are proposed. Students are encouraged to actively engage in learning activities and maintain effective study habits to improve their understanding of science concepts. Teachers should continuously participate in professional development programs focusing on innovative teaching strategies and technology integration. Schools must invest in laboratory facilities, instructional materials, and manageable workloads to support effective teaching. Parents should provide consistent academic support and encouragement to foster students' interest in science. School administrators and DepEd are advised to enhance support systems through scholarships, policy improvements, and resource provision.

FURTHER STUDY

Lastly, future researchers are encouraged to expand the scope of the study and explore additional variables to further validate and enrich the findings.

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