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# Instructional Approaches in Science Education Across Eastern Tabuk District: Issues and Innovations

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## Abstract

This study determined the instructional approaches used in teaching Science in the public secondary schools across Eastern Tabuk District during School Year 2025-2026. It examined the profile of Science teacher-respondents, the extent of realization of the general objectives of Science instruction, the effectiveness of teaching parameters, the hindrances encountered by teachers, and the enrichment activities used to address these concerns. The study used a descriptive-survey design with 19 Science teachers as respondents. Data were gathered through a validated questionnaire and unstructured interviews, and were analyzed using frequency counts, percentages, and weighted mean. Findings revealed that most respondents were young, female, married, Teacher I or Teacher II, and Science majors. The general objectives of Science instruction were realized, with an average weighted mean of 4.08. Teaching parameters were rated effective for school heads (3.87), teachers (4.16), students (3.72), parents (4.16), and stakeholders (4.06). Hindrances were slightly serious, with a grand weighted mean of 2.50; student-related concerns were the most serious, particularly absenteeism, unwise use of leisure time, lack of self-confidence, and inability to express ideas. Enrichment activities were often used, with an average weighted mean of 4.15. The study concludes that Science instruction in Eastern Tabuk District is effective, yet learner-centered intervention, stronger instructional supervision, parental engagement, and continuous teacher development remain necessary to improve Science learning outcomes.

**Keywords:** Eastern Tabuk District; Enrichment Activities; Instructional Approaches; Science Education; Science Instruction

## 1. Introduction

Science education is central to preparing learners who can ask questions, examine evidence, solve problems, and make informed decisions about health, environment, technology, and daily life. In the Philippine basic education curriculum, Science is expected to develop scientific literacy through concepts, process skills, values, and real-life applications. The renewed focus on competencies in the MATATAG curriculum calls for Science lessons that are meaningful, inquiry-oriented, and connected to learners' lived experiences (Department of Education, 2023).

International discussions on education also point to the need for learners to develop knowledge, skills, values, and attitudes that help them respond to changing social and technological demands (UNESCO, 2021). In Science classrooms, this requires instruction that moves beyond recall and encourages learners to observe, investigate, communicate, and explain ideas using evidence. Recent studies on active and flipped learning show that guided, student-centered activities can improve engagement, confidence, and achievement when teachers provide clear structure and feedback (Cheng et al., 2019; Campillo-Ferrer and Miralles-Martinez, 2021; Buhl-Wiggers et al., 2023; Baig and Yadegaridehkordi, 2023).

Teachers play a decisive role in making these approaches work. Their subject knowledge, lesson preparation, classroom management, assessment practices, and willingness to use innovations shape the quality of Science instruction. Professional development is most helpful when it is sustained, connected to actual classroom practice, and supported by school leadership (Sims et al., 2021). Likewise, school heads help strengthen Science teaching by giving instructional supervision, providing resources, and encouraging teacher growth (Ismail et al., 2020; Susanti et al., 2020).

At the same time, student learning is influenced by factors beyond the teacher. Attendance, study habits, confidence, communication skills, parental guidance, and stakeholder support can either strengthen or weaken classroom instruction. Evidence from recent education reports and studies indicates that engagement, regular participation, and home-school partnership matter in improving learners' performance and learning behavior (Lara and Saracostti, 2019; Ribeiro et al., 2021; OECD, 2023).

Despite these ideas, local classroom realities in Eastern Tabuk District show that Science teachers continue to face learner-related, administrative, parental, and resource-related concerns. These concerns may limit the full use of inquiry-based, participatory, and learner-centered approaches. Therefore, this study determined the instructional approaches used in teaching Science in the public

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secondary schools across Eastern Tabuk District. Specifically, it examined the teachers' profile, the realization of the general objectives of Science instruction, the effectiveness of teaching parameters, the hindrances encountered, and the enrichment activities used to reduce these hindrances. The findings may help teachers, school heads, parents, and stakeholders strengthen Science instruction through data-based and learner-responsive actions.

## 2. Material and methods

### 2.1 Research Design

This study employed a descriptive-survey research design to determine the instructional approaches used in teaching Science in the public secondary schools across Eastern Tabuk District, Tabuk City, Kalinga, for School Year 2025-2026. The design was appropriate because the study described existing conditions involving teacher profile, realization of Science instruction objectives, teaching parameters, hindrances, and enrichment activities. Descriptive survey research is useful when a study aims to present current practices and perceptions systematically (Creswell and Creswell, 2023).

### 2.2 Locale of the Study

The study was conducted in the public secondary schools across Eastern Tabuk District, Tabuk City, Kalinga, during School Year 2025-2026. This locale was selected because the Science teachers in the district were directly involved in the instructional practices, teaching parameters, hindrances, and enrichment activities examined in the study.

### 2.3 Respondents of the Study

The respondents of the study were 19 Science teachers currently teaching in the public secondary schools of Eastern Tabuk District during School Year 2025-2026. They represented the teachers directly involved in Science instruction and provided first-hand information on teaching practices, concerns, and enrichment activities.

### 2.4 Sample and Sampling Procedure

Total enumeration was used because the number of Science teachers in the district was manageable and all were directly involved in Science instruction. Their inclusion allowed the study to gather information from teachers with varied teaching experience, specialization, educational attainment, seminar exposure, and performance ratings.

### 2.5 Research Instrument

Data were gathered using a structured questionnaire and unstructured interviews. The questionnaire was prepared by the researcher based on the objectives of the study and related literature on Science instruction, teacher practice, learner participation, parental involvement, and stakeholder support. Part I focused on the respondents' profile, while Part II covered the realization of the general objectives of Science instruction, effectiveness of teaching parameters, hindrances encountered, and enrichment activities utilized. The questionnaire was tried out with teachers who were not part of the actual respondents. Their comments were used to improve clarity, sequencing, and suitability of the instrument.

### 2.6 Data Gathering Procedure

After permission was secured from the concerned school authorities, the questionnaire was administered to the Science teacher-respondents. Unstructured interviews were also conducted to clarify responses and enrich the interpretation of teachers' instructional practices, concerns, and interventions.

### 2.7 Data Analysis Techniques

The data were analyzed using frequency counts and percentages for the respondents' profile, and weighted mean for the realization of Science instruction objectives, teaching parameters, hindrances, and enrichment activities. A five-point Likert scale was used to describe the responses.

### 2.8 Ethical Considerations

The study observed voluntary participation, confidentiality, and respectful treatment of respondents. The purpose of the study was explained to the teachers before data gathering. The respondents were assured that their answers would be used only for academic purposes and that no identifying information would be disclosed in the manuscript. Since the journal template requires anonymous review, author names and institutional identifiers were removed from the manuscript file.

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## 3. Results and discussion

### 3.1 Profile of the Respondents

Table 1. *Frequency and percentage distribution of respondents in terms of age*

| Age | Frequency | Percentage (%) |
|---|---|---|
| 25-30 | 10 | 52.63 |
| 31-35 | 1 | 5.26 |
| 36-40 | 6 | 31.58 |
| 41-45 | 2 | 10.53 |
| 46-50 | 0 | 0.00 |
| 51 and above | 0 | 0.00 |
| Total | 19 | 100.00 |

Table 1 shows that the largest group of Science teachers was 25-30 years old (52.63%), followed by those aged 36-40 years old (31.58%). This points to a young teaching force that can still be shaped through sustained mentoring, peer learning, and professional development. Recent work on teacher learning indicates that continuing training becomes more useful when it is connected to classroom practice and supported by school leaders (Sims et al., 2021).

Table 2. *Frequency and percentage distribution of respondents in terms of gender*

| Gender | Frequency | Percentage (%) |
|---|---|---|
| Male | 4 | 21.05 |
| Female | 15 | 78.95 |
| Total | 19 | 100.00 |

Table 2 presents that female teachers comprised 78.95% of the respondents, while male teachers accounted for 21.05%. The distribution does not weaken the delivery of Science instruction; instead, it shows the need to support all teachers equally through access to materials, training, and recognition of classroom work. Equity-sensitive school leadership is important in sustaining teacher participation and professional confidence (UNESCO, 2021).

Table 3. *Frequency and percentage distribution of respondents in terms of civil status*

| Civil Status | Frequency | Percentage (%) |
|---|---|---|
| Single | 6 | 31.58 |
| Married | 13 | 68.42 |
| Widow | 0 | 0.00 |
| Total | 19 | 100.00 |

Table 3 indicates that most Science teachers were married (68.42%), while 31.58% were single. This profile may affect teachers' time for graduate studies, seminars, and school activities; therefore, professional learning opportunities should be practical, flexible, and supportive of teachers' work-life demands. Professional development that is responsive to teachers' actual conditions is more likely to improve instruction (Sims et al., 2021).

Table 4. *Frequency and percentage distribution of respondents in terms of position*

| Position | Frequency | Percentage (%) |
|---|---|---|
| Teacher I | 9 | 47.37 |
| Teacher II | 9 | 47.37 |
| Teacher III | 1 | 5.26 |
| Master Teacher I | 0 | 0.00 |
| Master Teacher II | 0 | 0.00 |
| Total | 19 | 100.00 |

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Table 4 reveals that Teacher I and Teacher II positions each represented 47.37% of the respondents, while only 5.26% were Teacher III. Since none occupied Master Teacher positions, the district may need stronger coaching, classroom-based technical assistance, and career progression support. Instructional leadership and school-based support have been linked with better teacher practice and teaching quality (Ismail et al., 2020; Susanti et al., 2020).

Table 5. *Frequency and percentage distribution of respondents in terms of specialization*

| Specialization | Frequency | Percentage (%) |
|---|---|---|
| Major | 16 | 84.21 |
| Minor | 3 | 15.79 |
| Total | 19 | 100.00 |

Table 5 shows that 84.21% of the respondents were Science majors, while 15.79% were Science minors. This is a strong point because subject specialization helps teachers explain concepts, design activities, and respond to students' questions. Inquiry-oriented Science learning works better when teachers have sufficient content knowledge and can guide learners without removing student participation (Riegle-Crumb et al., 2023).

Table 6. *Frequency and percentage distribution of respondents in terms of highest educational attainment*

| Highest Educational Attainment | Frequency | Percentage (%) |
|---|---|---|
| Bachelor's Degree | 13 | 68.42 |
| Master's Degree | 5 | 26.32 |
| Doctoral Degree | 1 | 5.26 |
| Total | 19 | 100.00 |

Table 6 indicates that 68.42% of the respondents held a bachelor's degree, 26.32% had a master's degree, and 5.26% had a doctoral degree. The data show a need to encourage graduate study and structured professional learning, particularly because Science teaching changes with curriculum reforms, technology use, and learner diversity. Continuing teacher learning is tied to stronger instructional decisions and improved learner support (Sims et al., 2021).

Table 7. *Frequency and percentage distribution of respondents in terms of number of years in service*

| Years in Service | Frequency | Percentage (%) |
|---|---|---|
| 1-5 years | 8 | 42.11 |
| 6-10 years | 4 | 21.05 |
| 11-15 years | 4 | 21.05 |
| 16-20 years | 3 | 15.79 |
| 21 years and above | 0 | 0.00 |
| Total | 19 | 100.00 |

Table 7 shows that 42.11% had been teaching for 1-5 years, while the rest had longer service ranging from 6 to 20 years. This mix of newer and more experienced teachers can be used for mentoring, collaborative lesson study, and peer coaching. Schools that create teacher collaboration opportunities are better positioned to strengthen classroom practice (UNESCO, 2021).

Table 8. *Frequency distribution of respondents in terms of levels of seminars attended*

| Level | Frequency | Rank |
|---|---|---|
| National Level | 9 | 1 |
| Regional Level | 2 | 3 |
| Division Level | 7 | 2 |
| School Level | 1 | 4 |

Table 8 shows that the most frequently attended seminars were at the national level, followed by division-level seminars. Attendance across different levels indicates that teachers have been exposed to professional learning opportunities, but seminar participation should still be translated into classroom action. Training has greater value when teachers are supported in applying new strategies, reviewing learner evidence, and reflecting on instruction (Sims et al., 2021).

Table 9. *Frequency and percentage distribution of respondents in terms of latest performance rating*

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| Latest Performance Rating | Frequency | Percentage (%) |
|---|---|---|
| Outstanding | 7 | 36.84 |
| Very Satisfactory | 10 | 52.63 |
| Satisfactory | 2 | 10.53 |
| Total | 19 | 100.00 |

Table 9 presents that 52.63% were rated Very Satisfactory, 36.84% were Outstanding, and 10.53% were Satisfactory. These ratings indicate generally capable performance among the Science teachers. The two teachers rated Satisfactory, however, may benefit from mentoring and instructional coaching, since supervision and school culture can contribute to quality teaching (Susanti et al., 2020).

### 3.2 Realization of the General Objectives in Science

Table 10. *Realization of the general objectives in Science*

| Items | Weighted Mean | Qualitative Description | Rank |
|---|---|---|---|
| 1. The learner is expected to develop functional understanding and application of science and health concepts, basic process/thinking skills, and acquire values, attitudes, and practices related to one's sense organs, personal health, food nutrition, growth and development, characteristics of plants and animals, caring for plants and animals, states of matter, heat, light and sound energy, force and motion, earth resources and their conservation, weather, and the sun as source of light and heat. | 4.12 | R | 1 |
| 2. The learner is expected to develop functional understanding and application of science and health concepts, basic process/thinking skills, and acquire values, attitudes, and practices related to body systems, disease prevention and control, animal and plant reproduction, soil erosion, weather elements, reaction of different substances, friction and heat energy, earth, moon, and sun. | 4.05 | R | 4 |
| 3. The learner is expected to develop functional understanding and application of science and health concepts, basic and integrated science process/thinking skills, and acquire values, attitudes, and practices related to body systems, disease prevention and control, classification of plants and animals, plant and animal adaptation, changes in matter, electrical energy, simple machines, rocks, water cycle, typhoons, tides, and the solar system. | 4.09 | R | 2 |
| 4. The learner is expected to develop functional understanding and application of science and health concepts, basic and integrated science process/thinking skills, and acquire values, attitudes, and practices related to body systems, ecosystem, materials and their uses and effects, energy transformation and conservation, movement of the earth's crust, climate and seasons, and beyond the solar system. | 4.07 | R | 3 |
| Average Weighted Mean | 4.08 | Realized | |

Table 10 shows that the general objectives of Science instruction were Realized, with an average weighted mean of 4.08. The highest indicator obtained a mean of 4.12, indicating that learners were guided in developing functional understanding, process skills, and values related to Science and health concepts. The other objectives also received realized ratings, with means ranging from 4.05 to 4.09. These results mean that Science instruction in the district is aligned with the development of scientific literacy, process skills, and responsible attitudes expected in the curriculum. This is consistent with the competency-based direction of the Science curriculum and the broader call for learners to apply knowledge to real-life problems (Department of Education, 2023; OECD, 2023).

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### 3.3 Effectiveness of the Parameters in Teaching Science Instruction

Table 11. *Effect of the parameters in teaching Science instruction as to school heads*

| Items | Weighted Mean | Qualitative Description | Rank |
|---|---|---|---|
| 1. Checks lesson log/plan regularly | 4.16 | E | 1 |
| 2. Observes teachers at any time of the day | 4.12 | E | 3 |
| 3. Conducts study session/school-based seminar workshop | 4.03 | E | 6 |
| 4. Procures needed materials in Science | 4.14 | E | 2 |
| 5. Extends guidance to teachers during pre- and post-conference and observation | 3.40 | ME | 8 |
| 6. Sends teachers to attend higher level of seminar in Science | 4.09 | E | 4 |
| 7. Motivates teachers to go back to school for professional growth/advancement | 3.37 | ME | 9 |
| 8. Conducts fair and just evaluation to teachers and pupils | 3.34 | ME | 10 |
| 9. Introduces classroom innovation | 4.05 | E | 5 |
| 10. Encourages teachers to attend higher level of seminars | 4.00 | E | 7 |
| Average Weighted Mean | 3.87 | Effective | |

Table 11 shows an average weighted mean of 3.87, described as Effective. The highest items were checking lesson logs/plans (4.16) and procuring needed Science materials (4.14), which indicate that school heads provide visible instructional support. The lower ratings on guidance during conferences (3.40), motivation for graduate study (3.37), and fair evaluation (3.34) point to areas where closer mentoring may still be strengthened. Instructional leadership is important because school heads influence teacher practice through supervision, resource support, and professional learning opportunities (Ismail et al., 2020; Susanti et al., 2020).

Table 12. *Effect of the parameters in teaching Science instruction as to teachers*

| Items | Weighted Mean | Qualitative Description | Rank |
|---|---|---|---|
| 1. Knowledgeable on the subjects taught | 4.27 | VE | 1 |
| 2. Preparation of accurate lesson logs/plan | 4.25 | VE | 2 |
| 3. Serves as a demonstration teacher when assigned | 4.21 | VE | 4 |
| 4. Pupils achieve mastery of the subject matter | 4.15 | E | 6 |
| 5. Abreast of the modern trends of the teaching-learning process | 4.13 | E | 7 |
| 6. Gives and follows up on homework | 4.09 | E | 8 |
| 7. Conducts participatory activities | 4.02 | E | 10 |
| 8. Upgrades himself/herself in the new trends of teaching through attending seminars | 4.23 | VE | 3 |
| 9. Well presentation of the subject matter | 4.16 | E | 5 |
| 10. Conducts remedial instruction to low-performing students | 4.05 | E | 9 |
| Average Weighted Mean | 4.16 | Effective | |

Table 12 presents an average weighted mean of 4.16, described as Effective. Teachers were rated Very Effective in subject knowledge (4.27), lesson preparation (4.25), seminar-based upgrading (4.23), and serving as demonstration teachers (4.21). These ratings mean that Science teachers have strong preparation for instruction. Still, participatory activities (4.02) and remedial instruction (4.05) received lower ranks, indicating the need for more active and differentiated strategies. Active learning and structured student participation can improve engagement and achievement when lessons are guided and purposeful (Cheng et al., 2019; Theobald et al., 2020).

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Table 13. *Effect of the parameters in teaching Science instruction as to students*

| Items | Weighted Mean | Qualitative Description | Rank |
|---|---|---|---|
| 1. Adheres to school/classroom policies and standards | 3.40 | ME | 6 |
| 2. Regular attendance in school | 3.36 | ME | 7 |
| 3. Shows interest to the subject | 4.11 | E | 1 |
| 4. Follows the given instruction accurately | 4.13 | E | 2 |
| 5. Attends classes on time | 3.34 | ME | 8 |
| 6. Makes homework and submits required projects on time | 3.28 | ME | 10 |
| 7. Reviews lessons at night | 4.10 | E | 3 |
| 8. Requests parents to guide him/her whenever possible | 4.07 | E | 5 |
| 9. Attends review classes and important activities in school | 4.09 | E | 4 |
| 10. Works cooperatively with the teachers as the need arises | 3.31 | ME | 9 |
| Average Weighted Mean | 3.72 | Effective | |

Table 13 shows an average weighted mean of 3.72, described as Effective. Students followed instructions accurately (4.13), showed interest in Science (4.11), and reviewed lessons at night (4.10). However, homework submission (3.28), cooperation with teachers (3.31), punctuality (3.34), and attendance (3.36) were only Moderately Effective. These results indicate that learner motivation exists, but habits related to attendance, responsibility, and follow-through need closer guidance. Student engagement, independent learning, and regular participation are consistently tied to learning gains and achievement (Hardiansyah and Rasia, 2022; Susiani et al., 2022; OECD, 2023).

Table 14. *Effect of the parameters in teaching Science instruction as to parents*

| Items | Weighted Mean | Qualitative Description | Rank |
|---|---|---|---|
| 1. Extends high regard to teachers | 4.20 | E | 4 |
| 2. Communicates effectively with teachers when problems arise | 4.15 | E | 6 |
| 3. Gives due respect to school authorities | 4.28 | VE | 1 |
| 4. Helps solve school problems as urgently as possible | 4.08 | E | 9 |
| 5. Works cooperatively with teachers | 4.26 | VE | 2 |
| 6. Visits the child at school | 4.17 | E | 5 |
| 7. Dialogues with teachers if needed | 4.01 | E | 10 |
| 8. Gives importance to the child's education | 4.23 | VE | 3 |
| 9. Provides important needs to the child | 4.07 | E | 8 |
| 10. Regular attendance at meetings called for | 4.12 | E | 7 |
| Average Weighted Mean | 4.16 | Effective | |

Table 14 indicates an average weighted mean of 4.16, described as Effective. Parents were Very Effective in giving respect to school authorities (4.28), working cooperatively with teachers (4.26), and valuing their child's education (4.23). Lower-ranked indicators, such as dialogue with teachers when needed (4.01) and helping solve school problems urgently (4.08), show that parents may still be encouraged to participate more actively. Parental involvement is associated with stronger academic achievement and better home-school support for learners (Lara and Saracostti, 2019; Ribeiro et al., 2021).

Table 15. *Effect of the parameters in teaching Science instruction as to stakeholders*

| Items | Weighted Mean | Qualitative Description | Rank |
|---|---|---|---|
| 1. Extended full support to all the school projects and programs | 4.26 | VE | 1 |
| 2. Gives financial support regularly for the school needs | 3.35 | ME | 7 |
| 3. Maintains good relation to school personnel | 4.18 | E | 3 |
| 4. Attends scheduled meetings/conference regularly | 4.09 | E | 6 |
| 5. Supports and helps maintain school ground clean | 4.15 | E | 4 |

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| Items | Weighted Mean | Qualitative Description | Rank |
|---|---|---|---|
| 6. Visits school as needed | 4.12 | E | 5 |
| 7. Extends services as the need arises | 4.24 | VE | 2 |
| Average Weighted Mean | 4.06 | Effective | |

Table 15 shows an average weighted mean of 4.06, described as Effective. Stakeholders were Very Effective in supporting school projects and programs (4.26) and extending services when needed (4.24). The lowest mean was financial support (3.35), described as Moderately Effective, which means that stakeholder help is stronger in service and participation than in regular funding. Community participation remains valuable because schools need shared responsibility to sustain learning opportunities and resource support (Ballarta et al., 2022; UNESCO, 2021).

### 3.4 Hindrances Encountered in Teaching Science

Table 16. *Hindrances encountered in teaching Science as to school heads*

| Items | Weighted Mean | Qualitative Description | Rank |
|---|---|---|---|
| 1. Limited time to monitor teachers at work due to office work | 2.60 | SS | 1 |
| 2. Irregularity in observing classes due to other related activities | 2.53 | SS | 3 |
| 3. Poor motivation for teachers to upgrade themselves in the modern trends of teaching Science | 2.56 | SS | 2 |
| 4. Frequent observation conducted | 2.48 | LS | 5 |
| 5. Poor implementation of Science instruction | 2.51 | SS | 4 |
| Average Weighted Mean | 2.54 | Slightly Serious | |

Table 16 shows an average weighted mean of 2.54, described as Slightly Serious. The leading concerns were limited time to monitor teachers because of office work (2.60) and poor motivation for teachers to upgrade themselves in modern Science teaching trends (2.56). These indicate that school heads may need to balance administrative duties with instructional supervision. Research on school leadership indicates that supervision, coaching, and teacher development support are essential to teaching quality (Ismail et al., 2020; Susanti et al., 2020).

Table 17. *Hindrances encountered by the teachers in teaching Science*

| Items | Weighted Mean | Qualitative Description | Rank |
|---|---|---|---|
| 1. Unfair evaluation of students' performance | 2.56 | SS | 1 |
| 2. Negative attitude in attending a seminar/workshop due to financial constraints | 2.48 | SS | 4 |
| 3. Irregularity of the lesson plan due to intervening school activities | 2.53 | SS | 2 |
| 4. Unfavorable atmosphere during classroom visits | 2.45 | SS | 5 |
| 5. Negative attitude to new innovations | 1.76 | LS | 6 |
| 6. Unable to relieve the tension of the class during classroom instruction | 2.51 | SS | 3 |
| Average Weighted Mean | 2.38 | Slightly Serious | |

Table 17 presents an average weighted mean of 2.38, described as Slightly Serious. The highest concerns were unfair evaluation of students' performance (2.56), irregularity of lesson plans due to intervening school activities (2.53), and difficulty relieving class tension during instruction (2.51). These concerns point to the need for clearer assessment practices, protected instructional time, and classroom management support. Teacher professional development is more effective when it addresses teachers' direct classroom needs rather than remaining as general training (Sims et al., 2021).

Table 18. *Hindrances encountered in teaching Science as to students*

| Items | Weighted Mean | Qualitative Description | Rank |
|---|---|---|---|
| 1. Lacks interest in the subject/reading | 2.60 | SS | 5 |
| 2. Frequent absenteeism | 3.40 | MS | 1 |

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| Items | Weighted Mean | Qualitative Description | Rank |
|---|---|---|---|
| 3. Unwise use of leisure time | 3.37 | MS | 2 |
| 4. Limited exposure to varied reading materials | 2.58 | SS | 6 |
| 5. Uncomfortable home environment | 2.53 | SS | 8 |
| 6. Low performance | 2.51 | SS | 9 |
| 7. Lacks self-confidence | 3.35 | MS | 3 |
| 8. Bad influence of friends | 2.55 | SS | 7 |
| 9. Inability to express ideas | 3.33 | MS | 4 |
| 10. Change of residence | 1.78 | LS | 10 |
| Average Weighted Mean | 2.80 | Moderately Serious | |

Table 18 shows an average weighted mean of 2.80, described as Moderately Serious. Student-related concerns were the most pressing, especially frequent absenteeism (3.40), unwise use of leisure time (3.37), lack of self-confidence (3.35), and inability to express ideas (3.33). These results indicate that Science teachers need interventions that address attendance, motivation, confidence, and oral participation. Learners benefit from supportive activities that increase engagement, responsibility, and confidence in learning tasks (Hardiansyah and Rasia, 2022; OECD, 2023).

Table 19. *Hindrances encountered in teaching Science as to parents*

| Items | Weighted Mean | Qualitative Description | Rank |
|---|---|---|---|
| 1. Poor home environment | 2.58 | SS | 2 |
| 2. Many children to attend for | 2.53 | SS | 4 |
| 3. Financial constraints | 2.56 | SS | 3 |
| 4. No time to attend scheduled meetings | 3.34 | MS | 1 |
| 5. Uncooperative with teachers | 2.46 | SS | 7 |
| 6. Not supportive of non-academic activities | 2.41 | SS | 9 |
| 7. Magnify school problems and issues | 2.51 | SS | 5 |
| 8. Poor guidance was extended to children | 2.48 | SS | 6 |
| 9. Unable to guide children due to limited knowledge of the lesson for home study | 2.43 | SS | 8 |
| 10. Single parent | 1.75 | LS | 10 |
| Average Weighted Mean | 2.51 | Slightly Serious | |

Table 19 presents an average weighted mean of 2.51, described as Slightly Serious. The most serious parent-related concern was lack of time to attend scheduled meetings (3.34), followed by poor home environment (2.58) and financial constraints (2.56). These findings mean that parental support is present, but time, resources, and home responsibilities may limit direct participation. Studies on family-school relations show that meaningful communication and flexible participation help parents support student learning despite home constraints (Lara and Saracostti, 2019; Ribeiro et al., 2021).

Table 20. *Hindrances encountered in teaching Science as to stakeholders*

| Items | Weighted Mean | Qualitative Description | Rank |
|---|---|---|---|
| 1. Do not extend financial assistance | 2.56 | SS | 1 |
| 2. Poor attendance at scheduled meetings | 2.53 | SS | 3 |
| 3. Lacks cooperation | 2.54 | SS | 2 |
| 4. Do not support school/classroom projects | 1.75 | LS | 5 |
| 5. Negative attitude to communal work | 1.73 | LS | 6 |
| 6. Inactive participation in co-curricular activities | 1.78 | LS | 4 |
| Average Weighted Mean | 2.15 | Slightly Serious | |

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Table 20 shows an average weighted mean of 2.15, described as Slightly Serious. Stakeholder-related concerns were less severe than student-related concerns, but lack of financial assistance (2.56), limited cooperation (2.54), and poor meeting attendance (2.53) still need attention. Schools can build stronger partnerships by inviting stakeholders into concrete, manageable tasks connected to learner development and school improvement (Ballarta et al., 2022; UNESCO, 2021).

Table 21. *Summative table on the hindrances encountered in teaching Science instruction*

| Items | Weighted Mean | Qualitative Description | Rank |
|---|---|---|---|
| School Heads | 2.54 | SS | 2 |
| Teachers | 2.38 | SS | 4 |
| Students | 2.80 | MS | 1 |
| Parents | 2.51 | SS | 3 |
| Stakeholders | 2.15 | SS | 5 |
| Grand Weighted Mean | 2.50 | Slightly Serious | |

Table 21 gives a grand weighted mean of 2.50, described as Slightly Serious. Among the five categories, students had the highest mean (2.80), indicating that learner behavior, participation, confidence, and attendance are the main concerns in Science instruction. School heads (2.54) and parents (2.51) followed, while stakeholders had the lowest mean (2.15). The pattern shows that improvements in Science learning should begin with student support while keeping administrative, parental, and community assistance active (OECD, 2023; Ribeiro et al., 2021).

### 3.5 Enrichment Activities Utilized by Teachers

Table 22. *Enrichment activities utilized by the teachers to minimize the hindrances met*

| Items | Weighted Mean | Qualitative Description | Rank |
|---|---|---|---|
| 1. Implement intervention plans based on the students' needs | 4.20 | O | 4 |
| 2. Conducts remedial teaching to the least performing learners | 4.09 | O | 8 |
| 3. Fits methods and strategies to the students' level | 4.15 | O | 6 |
| 4. Provides interesting activities to improve their learning | 4.12 | O | 7 |
| 5. Gives and checks homework to study | 4.26 | VO | 1 |
| 6. Remedial activities to least mastered competencies | 4.18 | O | 5 |
| 7. Identifies the weaknesses of the students | 4.05 | O | 9 |
| 8. Gives priority to students with difficulties | 4.01 | O | 10 |
| 9. Established open line communication to students | 4.23 | VO | 2 |
| 10. Requires full participation during class interaction | 4.21 | VO | 3 |
| Average Weighted Mean | 4.15 | Often | |

Table 22 shows that enrichment activities were Often utilized, with an average weighted mean of 4.15. The most frequently used activities were giving and checking homework (4.26), establishing open communication with students (4.23), and requiring full participation during class interaction (4.21). These practices directly respond to the student-related concerns reported earlier, particularly absenteeism, limited confidence, and weak participation. Recent studies on flipped, active, and guided learning show that students benefit when teachers provide structured preparation, feedback, participation, and opportunities to apply ideas in class (Campillo-Ferrer and Miralles-Martinez, 2021; Baig and Yadegaridehkordi, 2023; Samadi et al., 2024).

## 4. Conclusion & Recommendations

The findings show that Science instruction in the public secondary schools across Eastern Tabuk District is generally effective. The teacher-respondents were mostly young, female, married, and positioned at Teacher I and Teacher II levels. Most were Science majors, and their seminar exposure and performance ratings indicate a capable teaching force that can still grow through mentoring, graduate education, and school-based professional development. The general objectives of Science instruction were realized, which means that teachers were able to help learners acquire scientific knowledge, process skills, values, and attitudes. Teaching parameters involving school heads, teachers, students, parents, and stakeholders were also effective. These results point to the value of shared support in Science instruction, particularly through teacher competence, school head supervision, parental

cooperation, and stakeholder participation. Student-related hindrances were the most serious concerns, especially absenteeism, unwise use of leisure time, lack of self-confidence, and inability to express ideas. Concerns related to school heads, teachers, parents, and stakeholders were present but were rated slightly serious. In response, teachers often used enrichment activities such as assigning and checking homework, keeping open communication with students, requiring active class participation, adjusting teaching strategies to learners' levels, and providing remedial activities for least mastered competencies. The study indicates that Science teaching in Eastern Tabuk District can be further strengthened through continuous teacher development, more focused instructional supervision, stronger parent communication, better stakeholder participation, and learner-centered interventions that address attendance, confidence, and classroom engagement. Future research may examine the impact of specific Science teaching strategies, technology-supported instruction, and targeted interventions for students with low participation or frequent absences.

Based on the findings, Science instruction may be strengthened through continuous teacher development, more focused instructional supervision, stronger parent communication, increased stakeholder participation, and learner-centered interventions that address absenteeism, confidence, classroom engagement, and oral expression. Future research may examine the impact of specific Science teaching strategies, technology-supported instruction, and targeted interventions for students with low participation or frequent absences.

The study was limited to 19 Science teachers in the public secondary schools across Eastern Tabuk District during School Year 2025-2026. Since the study used a descriptive-survey design with questionnaire responses and unstructured interviews, the findings describe the conditions and perceptions of the respondents and may not fully represent Science instruction in other districts or school divisions.

## Compliance with ethical standards

The study complied with institutional academic and ethical standards by securing permission from the concerned school authorities, explaining the purpose of the study to the respondents, and observing voluntary participation, informed consent, confidentiality, and respectful treatment of all participants. The responses were used only for academic purposes, no identifying information was disclosed in the manuscript, the authors take responsibility for the integrity and originality of the work, and no conflict of interest was declared. All contributions and source materials were acknowledged, and copyright responsibility for the manuscript remains with the authors in accordance with journal and institutional policies.

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