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Social-Emotional Learning (SEL)-Based Activities In Science To Improve Grade 8 Students' Engagement In Occidental Mindoro National High School-San Luis Extension

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Abstract

This research investigated the impact of Social-Emotional Learning (SEL)-based activities on Grade 8 students' engagement in Science at Occidental Mindoro National High School–San Luis Extension. Specifically, it sought to determine students' engagement levels before and after SEL implementation; describe the influence of key SEL factors—self-awareness, self-management, social awareness, relationship skills, and decision making—on engagement; assess the effects of selected SEL-based activities (Science Reflection Journal, Mindful Science Moment, Science and Society Discussion, and Science Buddies); (4) identify challenges in utilizing SEL strategies; and propose enrichment activities to enhance SEL integration. Using a descriptive quantitative research design, the study involved 49 purposively selected Grade 8 students during the school year 2025 2026.

Results showed a significant improvement in engagement, with composite mean scores increasing from "High" before SEL integration to consistently "High" after implementation. Among the five SEL domains, students showed the highest engagement in self-awareness and relationship skills, while challenges were more evident in self-management and responsible decision-making. SEL-based activities were found effective in enhancing emotional regulation, motivation, collaboration, and critical thinking.

Despite positive outcomes, students reported moderate challenges in expressing emotions, staying motivated during emotionally difficult tasks, and applying SEL strategies beyond the classroom. To address these, the study proposed enrichment activities including SEL Story Circles, Conflict Resolution Role-Plays, and Community-Based Science Projects. The study concludes that integrating SEL into Science instruction fosters a more engaging, empathetic, and supportive learning environment. It recommends institutional support, teacher training, and localized SEL frameworks aligned with the MATATAG Curriculum to ensure effective and sustainable implementation.

Keywords: Social-Emotional Learning (SEL)-based activities, Students' Engagement, SEL Domains, Emotional Regulation, SEL Implementation

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Introduction

Student engagement in science remains a significant challenge in Philippine secondary education due the subject's abstract concepts, which often make learning difficult and less engaging for learners. Despite ongoing curriculum reforms under the Department of Education's MATATAG Agenda, which promotes holistic learner development, many students still struggle with participation and meaningful engagement in Science classes (DepEd, 2023).

To address these challenges, Social-Emotional Learning (SEL) has gained attention as an instructional approach that develops learners' self-awareness, emotional regulation, motivation, and responsible decision-making. SEL strategies such as reflection activities, mindfulness practices, and collaborative learning have been shown to improve both academic performance and classroom behavior. However, in the Philippine context, implementation remains limited due to factors such as lack of culturally appropriate materials, insufficient teacher training, and resource constraints (Molina et al., 2025). These issues are compounded by broader systemic problems in Science education, including low achievement levels and fragmented support systems (Llego, 2024), as reflected in international assessments like PISA 2022.

At the classroom level, Grade 8 learners often experience anxiety, low confidence, and fear of judgment, which negatively affect their participation in Science learning activities. Although SEL has been widely studied in general education, there is still limited research focusing on its application in subject-specific instruction such as Science. This gap highlights the need to explore how SEL-based strategies can directly influence student engagement in Science classrooms.

This research investigated the impact of SEL-based activities on Grade 8 students' engagement in Science at Occidental Mindoro National High School–San Luis Extension.

Specifically, it aimed to answer the following questions:

1.What is the average level of Grade 8 students' engagement in science classes relative to:
- 1.1 Before the implementation of social-emotional learning (SEL)-based activities; and
- 1.2 After the implementation of social-emotional learning (SEL)-based activities?

2.How may the key social-emotional factors that influence students' engagement in science be described in terms of:
- 2. 1 Self-Awareness;
- 2.2 Self-Management;
- 2.3 Social Awareness;
- 2.4 Relationship Skills; and
- 2.5 Decision-Making Skills?

3. How does the following social-emotional learning (SEL)-based activities affect Grade 8 students' engagement in Science as to:
- 3.1 Science Reflection Journal;
- 3.2 Mindful Science Moment;
- 3.3 Science and Society Discussion; and
- 3.4 Science Buddies?

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4. What are the hindrances faced by Grade 8 students in utilizing social-emotional learning (SEL)-based activities?

Methodology

Research Design

This study employed a **descriptive quantitative research design** to examine the impact of Social-Emotional Learning (SEL)-based activities on student engagement in Science. The descriptive approach was chosen to systematically gather and analyze data related to students' engagement levels, social-emotional competencies, and their experiences with SEL-based instructional strategies. This method was deemed appropriate for the study as it allowed for objective measurement of engagement before and after the implementation of SEL-based activities, as well as the identification of key SEL factors influencing participation

Participants

The study involved **49 Grade 8 students enrolled in Science classes at Occidental Mindoro National High School–San Luis Extension during the school year 2025–2026**. The participants were selected through **purposive sampling**, a non-probability technique that allowed the researcher to identify individuals who had direct exposure to the SEL-based activities implemented in the classroom. This sampling method ensured that the respondents could provide relevant and meaningful insights into the effectiveness of SEL strategies in enhancing Science engagement

Research Instrument

This study utilized a **structured survey questionnaire** as the primary data gathering instrument to collect quantitative data on students' engagement in Science and their experiences with Social-Emotional Learning (SEL)-based activities. The tool measured and assessed:

- Students' engagement levels before and after the implementation of SEL strategies
- Influence of key SEL competencies—self-awareness, self-management, social awareness, relationship skills, and responsible decision-making—on their participation in Science classes

A **four-point Likert scale** was used to quantify students' perceptions and engagement levels.

Data Gathering Procedure

The data gathering process began with the systematic development of a survey questionnaire based on relevant literature and the CASEL framework. The instrument underwent **expert validation** and **pilot testing** to ensure clarity, reliability, and alignment with the study's objectives. After **securing permission from the school head**, the survey was **administered to**

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48 Grade 8 students in a controlled classroom setting, with proper briefing on confidentiality and voluntary participation. Completed questionnaires were immediately checked for completeness, organized, and securely stored. Finally, responses were encoded and analyzed using a **four-point Likert scale** to measure students' engagement and perceptions

Data Analysis

The study utilized descriptive statistical tools, including **weighted mean, ranking, and composite mean**, to analyze students' responses.

- **Weighted Mean**- measured the level of agreement on each survey item, while
- **Ranking**-identified the most and least influential SEL factors affecting Science engagement.
- **Composite Mean**- provided an overall assessment of students' engagement and the impact of SEL-based activities.

Results

1. Level Of Grade 8 Students' Engagement In Science Classes

1.1. Before the Implementation of SEL-Based Activities

Table 1

Before the Implementation

Indicators	Weighted Mean	Verbal Interpretation
1. I actively participated in Science class discussions before SEL activities were introduced.	3.04	High
2. I found Science topics interesting and engaging before SEL strategies were used.	3.00	High
3. I felt motivated to complete Science tasks and assignments before SEL-based activities.	2.98	High
4. I enjoyed working with classmates during Science activities before SEL integration.	3.14	High
5. I felt emotionally connected to what I was learning in Science before SEL-based activities.	2.90	High
Composite Mean	**3.01**	**High**

The results in **Table 1** reveal that Grade 8 students had a **high level of engagement in Science before the implementation of SEL-based activities**, with a **composite mean of 3.01**. The highest engagement was observed in **collaborative work (WM = 3.14),** while **emotional**

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connection to learning was the lowest (WM = 2.90), though still **high.** Overall, students were already engaged, but there was room to further enhance their emotional involvement in learning.

1.2. After the Implementation

Table 2
After the Implementation of SEL-Based

Indicators	Weighted Mean	Verbal Interpretation
1. I actively participated in Science class discussions before SEL activities were introduced.	3.29	High
2. I found Science topics interesting and engaging before SEL strategies were used.	3.33	High
3. I felt motivated to complete Science tasks and assignments before SEL-based activities.	3.45	High
4. I enjoyed working with classmates during Science activities before SEL integration.	3.45	High
5. I felt emotionally connected to what I was learning in Science before SEL-based activities.	3.22	High
Composite Mean	**3.35**	**High**

The results in **Table 2** show that **after the implementation of SEL-based activities, Grade 8 students maintained a high level of engagement in Science,** with an increased **composite mean of 3.35**. All indicators improved, particularly **motivation and collaboration (WM = 3.45),** indicating that SEL strategies enhanced students' active participation, interest, and emotional connection to learning. Overall, the findings suggest that SEL integration positively strengthened student engagement in Science classes.

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2. Factors That Influence Students' Engagement In Science

2.1. Self Awareness

Table 3
Self-Awareness

Indicators	Weighted Mean	Verbal Interpretation
1.I feel confident participating in Science class discussions and activities.	3.43	Strongly Agree
2I understand how my emotions affect my participation in Science learning.	3.08	Agree
3. I know my strengths in Science and use them to stay engaged.	3.12	Agree
4. I am aware of my learning goals in Science and they motivate me to participate.	3.20	Agree
5. I reflect on my performance in Science to improve my engagement.	3.00	Agree
Composite Mean	**3.17**	**Agree**

The results in **Table 3** indicate that students demonstrated a generally **high level of self-awareness in Science**, with a **composite mean of 3.17 (Agree). Confidence in participating ranked highest (WM = 3.43, Strongly Agree),** while **reflection on performance was the lowest (WM = 3.00, Agree)**. Overall, the findings suggest that students are aware of their emotions, strengths, and goals, which supports their engagement in learning.

2.2 Self-Management

Table 4
Self-Management

Indicators	Weighted Mean	Verbal Interpretation
1. I can manage stress or anxiety during Science activities.	2.88	Agree
2. I stay focused and avoid distractions during Science lessons.	3.12	Agree
3. I manage my time well when completing Science tasks.	3.20	Agree
4. I continue working on Science tasks even when they are difficult.	3.22	Agree
5. I think before acting during Science group work or experiments.	3.35	Agree
Composite Mean	**3.15**	**Agree**

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The results in **Table 4** show that students have a **good level of self-management in Science, with a composite mean of 3.15 (Agree).** The highest-rated indicator was **thinking before acting (WM = 3.35),** while **managing stress or anxiety was the lowest (WM = 2.88).** Overall, students demonstrate positive control over their behavior, focus, and perseverance, though emotional regulation may still be improved.

2.3. Social Awareness

Table 5
Social Awareness

Indicators	Weighted Mean	Verbal Interpretation
1. I try to understand how my classmates feel during Science activities.	3.22	Agree
2. I show respect for others' ideas during Science discussions.	3.42	Agree
3. I consider different viewpoints when solving Science problems.	3.04	Agree
4. I include others in group Science activities regardless of differences.	3.24	Agree
5. I appreciate diverse backgrounds when learning Science topics.	3.22	Agree
Composite Mean	**3.23**	**Agree**

The results in **Table 5** indicate that **students exhibit a good level of social awareness in Science, with a composite mean of 3.23 (Agree). Respect for others' ideas ranked highest (WM = 3.42)**, while **considering different viewpoints was the lowest (WM = 3.04),** though still **positive.** Overall, students demonstrate respect, inclusivity, and understanding of others, supporting effective collaboration in learning.

2.4.Relationship Skills

Table 6
Relationship Skills

Indicators	Weighted Mean	Verbal Interpretation
1. I express my ideas clearly during Science group work.	3.16	Agree
2. I work well with others during Science experiments and projects.	3.24	Agree
3. I help resolve disagreements respectfully during Science activities.	3.22	Agree
4. I ask for help from classmates or teachers when I struggle in Science.	3.20	Agree
5. I contribute actively to group tasks in Science class.	3.02	Agree
Composite Mean	**3.17**	**Agree**

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The results in **Table 6** show that students have a **good level of relationship skills in Science, with a composite mean of 3.17 (Agree). Working well with others ranked highest (WM = 3.24)**, **while active contribution to group tasks was the lowest (WM = 3.02).** Overall, students demonstrate effective communication, cooperation, and support for peers, which enhances collaborative learning.

2.5. Decision-Making Skills

Table 7
Decision-Making Skills

Indicators	Weighted Mean	Verbal Interpretation
1. I make thoughtful decisions when solving Science problems.	3.18	Agree
2. I consider the outcomes of my actions during Science activities.	3.20	Agree
3. I make choices in Science that are fair and responsible.	3.02	Agree
4.I make decisions that help me achieve my Science learning goals.	3.28	Agree
5. I follow safety rules when conducting Science experiments.	3.28	Agree
Composite Mean	**3.19**	**Agree**

The results in **Table 7** indicate that students demonstrate a **good level of decision-making skills in Science, with a composite mean of 3.19 (Agree).** The **highest ratings** were in **making goal-oriented decisions and following safety rules (WM = 3.28),** while **making fair and responsible choices was the lowest (WM = 3.02).** Overall, students show thoughtful and responsible decision-making that supports their learning and safety in Science activities.

3. Effects of social-emotional learning (SEL)-based activities

3.1. Science Reflection Journal

Table 8
Science Reflection Journal

Indicators	Weighted Mean	Verbal Interpretation
1. Writing reflection journals helps me understand my thoughts and feelings about Science topics.	3.08	Agree
2. Journaling helps me clarify my learning goals in Science.	3.10	Agree
3. I can express my emotions and reactions to Science lessons through reflection writing.	3.08	Agree
4. Reflecting on my Science experiences helps me evaluate how I learn best.	3.04	Agree
5. I feel more connected and involved in Science class after writing reflection journals.	3.08	Agree
Composite Mean	**3.08**	**Agree**

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The results in **Table 8** show that **science reflection journals are generally effective in supporting student learning and engagement, with a composite mean of 3.08 (Agree)**. All indicators received similar ratings, indicating **consistent positive perceptions**. Overall, journaling helps students understand their thoughts, clarify goals, and feel more connected to Science learning.

3.2. Mindful Science Moment

The results in **Table 9** indicate that **mindful science moments have a positive effect on students' focus and emotional readiness, with a composite mean of 3.18 (Agree). Feeling calmer and more focused ranked highest (WM = 3.35),** while **improved concentration was the lowest (WM = 2.98).** Overall, mindfulness activities help students manage emotions and prepare mentally for Science learning.

Table 9
Mindful Science Moment

Indicators	Weighted Mean	Verbal Interpretation
1. I feel calmer and more focused during Science class after practicing mindful moments.	3.35	Agree
2. Mindful Science activities help reduce my anxiety before assessments or experiments.	3.24	Agree
3. I can concentrate better on Science tasks after engaging in mindfulness exercises.	2.98	Agree
4. Mindful moments help me recognize my emotions and how they affect my learning.	3.08	Agree
5. I feel mentally prepared to participate in Science activities after mindfulness practice.	3.24	Agree
Composite Mean	**3.18**	**Agree**

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3.3. Science and Society Discussion

Table 10
Science and Society Discussion

Indicators	Weighted Mean	Verbal Interpretation
1. Discussing real-world issues in Science helps me think more deeply about the subject.	3.20	Agree
2. I feel more engaged when Science lessons connect to societal problems and current events.	3.12	Agree
3. I understand others' perspectives better through Science and Society discussions.	2.87	Agree
4. I express my ideas more confidently during Science discussions about social issues	3.18	Agree
5. I am more motivated to learn Science when I see its impact on society.	3.22	Agree
Composite Mean	3.11	Agree

The results in **Table 10** show that **Science and Society discussions have a positive impact on student engagement, with a composite mean of 3.11 (Agree). Motivation to learn Science through its societal impact ranked highest (WM = 3.22)**, while **understanding others' perspectives was the lowest (WM = 2.87)**. Overall, students become more engaged, motivated, and confident when Science is connected to real-world issues.

3.4. Science Buddies

The results in **Table 11** indicate that the **Science Buddies approach has a positive effect on student engagement, with a composite mean of 3.23 (Agree). Feeling more confident when working with a buddy ranked highest (WM = 3.30),** while **building stronger friendships was the lowest (WM = 3.14).** Overall, buddy-based activities enhance confidence, understanding, and active participation in Science learning.

Table 11
Science Buddies

Indicators	Weighted Mean	Verbal Interpretation
1. I enjoy working with my Science buddy during experiments and group tasks.	3.26	Agree
2. My Science buddy helps me understand difficult concepts and stay engaged.	3.24	Agree
3. I build stronger friendships through buddy-based Science activities.	3.14	Agree
4. I feel more confident participating in Science when I work with a buddy.	3.30	Agree
5. I take my role seriously when working with a Science buddy, which improves my engagement.	3.20	Agree
Composite Mean	**3.23**	**Agree**

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4.Hindrances Faced By Grade 8 Students In Utilizing Social-Emotional Learning (SEL)-Based Activities

Table 12
Hindrances

Indicators	Weighted Mean	Verbal Interpretation	Ranking
1. I find it difficult to express my emotions during group activities.	2.77	Agree	1
2. I feel uncomfortable sharing personal experiences in class discussions.	2.71	Agree	2
3. I lack confidence when participating in peer collaboration tasks.	2.40	Disagree	7
4. I do not receive enough guidance from teachers on how to manage my emotions.	2.20	Disagree	9.5
5. I am unsure how to resolve conflicts with classmates during group work.	2.55	Agree	5
6. I find it hard to stay motivated when working on emotionally challenging tasks.	2.70	Agree	3
7. I do not understand the purpose of SEL activities in my Science class.	2.42	Disagree	8
8. I feel that SEL activities are not relevant to my personal experiences.	2.20	Disagree	9.5
9. I experience anxiety when asked to reflect on my behavior or choices.	2.51	Agree	6
10. I struggle to apply SEL strategies outside the classroom setting.	2.59	Agree	4
Composite Mean	**2.51**	**Agree**	

The results in **Table 12** show that **students generally experience moderate hindrances related to SEL in Science, with a composite mean of 2.51 (Agree).** The **most common difficulty is expressing emotions during group activities (WM = 2.77),** while **lack of teacher guidance and perceived irrelevance of SEL were the least concerns (WM = 2.20).** Overall, students still face challenges in emotional expression, confidence, and applying SEL strategies, which may affect their full engagement in learning.

5. Proposed Enrichment Activities

Based on the findings from the SEL-based science instruction and the challenges identified, the following enrichment activities are proposed to strengthen students' social-emotional competencies and enhance their engagement in science learning. Each activity is designed to be culturally relevant, inclusive, and aligned with the MATATAG Curriculum and SEL core competencies:

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- **Science Reflection Journals-** A weekly journaling activity where students reflect on their science learning experiences, emotions, challenges, and personal growth.
- **Science Buddies Program-**A peer mentoring system where students are paired to support each other during science tasks, experiments, and discussions.
- **Mindful Science Moments-**Short mindfulness exercises (e.g., breathing, visualization, grounding) conducted before or after science lessons or assessments
- **Science and Society Dialogues Description:** Structured classroom discussions that connect science topics to real-world societal issues (e.g., climate change, health, technology).
- **SEL Story Circles in Science Description:** A storytelling activity where students share personal or community-based experiences related to science topics (e.g., environmental practices, health habits).
- **Science Conflict Resolution Role-Plays Description:** Scenario-based role-playing where students practice resolving conflicts that may arise during group science tasks.
- **Community-Based Science Project -**Group projects that involve investigating and addressing local science-related issues (e.g., waste management, water quality).

Discussion

The findings of this study revealed that Grade 8 learners already demonstrated a generally high level of engagement in Science both before and after the implementation of Social and Emotional Learning (SEL)-based strategies. Prior to the intervention, students showed strong behavioral engagement, particularly in participation and collaboration. However, their relatively lower levels of emotional connection and intrinsic motivation indicated that affective engagement was less developed. After the implementation, improvements were observed in motivation, participation, and collaborative learning, suggesting that SEL strategies contributed positively to enhancing students' overall engagement. Nonetheless, emotional connection to Science remained comparatively lower, highlighting an area that still requires further strengthening.

These results align with existing literature emphasizing the persistent challenges in Science education in the Philippines. Studies by Servallos (2023) and Ojastro (2025) have documented low student performance in large-scale assessments such as PISA and the National Achievement Test, pointing to gaps not only in cognitive skills but also in motivation and interest in Science. The current findings support these claims, particularly in showing that while students may appear actively engaged, deeper emotional investment in learning is often lacking. Furthermore, the study corroborates the work of Mahoney et al. (2021), who argued that integrating SEL into academic instruction enhances both cognitive and emotional outcomes. Similarly, Solomo (2023) and Bumagat et al. (2023) emphasized the need for improved instructional strategies and teacher training, which SEL integration can help address by fostering more supportive, student-centered learning environments.

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The findings suggest that Science educators should go beyond promoting participation and task completion by intentionally integrating SEL strategies that nurture emotional connection, self-awareness, and intrinsic motivation. Classroom practices such as reflective journaling, collaborative problem-solving, and real-world application of scientific concepts can help bridge the gap between cognitive and affective engagement. Teachers should also be supported through continuous professional development programs that equip them with SEL-informed pedagogies and strategies for creating inclusive and emotionally supportive classroom environments.

The results highlight the importance of embedding SEL within the Science curriculum as part of a holistic approach to education. Educational leaders and policymakers, particularly within the Department of Education, may consider strengthening the integration of SEL competencies in curriculum frameworks, teacher training programs, and assessment systems. This aligns with broader educational reforms that prioritize learner well-being, resilience, and 21st-century skills development.

Among the five SEL domains, students demonstrated the highest engagement in self-awareness and relationship skills, indicating strong foundations in understanding themselves and interacting effectively with others. This is supported by Napa et al. (2022), who found that structured SEL activities enhance self-awareness and classroom participation, reinforcing the role of SEL in promoting both emotional and cognitive engagement. The findings also further reveal that students possess essential relationship skills that support collaboration in science, as seen in their ability to work well with peers, resolve conflicts respectfully, and seek help when needed—indicators of a positive and supportive classroom environment. While challenges were more evident in self-management and responsible decision-making. SEL-based activities were found effective in enhancing emotional regulation, motivation, collaboration, and critical thinking.

Despite positive outcomes, students reported moderate challenges in expressing emotions, staying motivated during emotionally difficult tasks, and applying SEL strategies beyond the classroom. To address these, the study proposed enrichment activities including SEL Story Circles, Conflict Resolution Role-Plays, and Community-Based Science Projects. The study concludes that integrating SEL into Science instruction fosters a more engaging, empathetic, and supportive learning environment. It recommends institutional support, teacher training, and localized SEL frameworks aligned with the MATATAG Curriculum to ensure effective and sustainable implementation.

Conclusion

1. The implementation of SEL-based activities significantly enhanced Grade 8 students' engagement in Science at Occidental Mindoro National High School–San Luis Extension, as evidenced by the increase in composite mean scores from "High" before SEL integration to "High" after its implementation.

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2. Among the five key social-emotional factors, students demonstrated the highest levels of engagement in self-awareness and relationship skills, while challenges were more evident in self-management and responsible decision-making.

3. The implementation of diverse SEL-based enrichment activities—namely, Science Reflection Journals, Science Buddies Program, Mindful Science Moments, Science and Society Dialogues, SEL Story Circles in Science, Science Conflict Resolution Role-Plays, and Community-Based Science Projects—effectively addressed the emotional, cognitive, and social dimensions of student engagement in Science.

4. Despite the positive outcomes, students encountered moderate challenges in expressing emotions, staying motivated during emotionally difficult tasks, and applying SEL strategies outside the classroom, with a composite mean indicating agreement on these difficulties

Recommendation

It is recommended that the diverse SEL-based enrichment activities—namely, Science Reflection Journals, Science Buddies Program, Mindful Science Moments, Science and Society Dialogues, SEL Story Circles in Science, Science Conflict Resolution Role-Plays, and Community-Based Science Projects may be used. In addition, Science teachers should regularly integrate structured SEL-based activities such as Science Reflection Journals, Mindful Science Moments, Science and Society Discussions, and Science Buddies into their lesson plans.

Given the challenges in emotional expression, motivation, and conflict resolution, it is essential to conduct capacity-building programs for Science teachers focused on SEL pedagogy. To address the gap in students' ability to apply SEL strategies beyond the classroom, schools should collaborate with local education stakeholders to design localized SEL materials and activities. To overcome systemic challenges such as limited resources, large class sizes, and lack of teacher support, school administrators should advocate for policy support and resource allocation.

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