



Science Club Operation: Challenges and Opportunities

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ABSTRACT

This study explored the lived experiences of Science Club advisers in selected public elementary schools in the Schools Division of Cadiz City during the 2025–2026 academic year. The study employed a qualitative phenomenological research design to examine how advisers manage and sustain science club operations in resource-constrained school environments. Purposive sampling was used to select ten (10) Science Club advisers who had at least three years of experience managing active science clubs in public elementary schools. Data were collected through semi-structured in-depth interviews and were analyzed using thematic analysis following Creswell’s qualitative data analysis procedures. The findings revealed three key themes. The first theme, Current Operational Practices of Science Club Advisers, which include program planning, administrative coordination, student engagement, and balancing instructional and co-curricular responsibilities. The second theme, Challenges Encountered by Science Club Advisers, such as limited funding, inadequate facilities, heavy workload, and insufficient stakeholder support. The third theme, Opportunities for Science Club Advisers, highlighting adviser resourcefulness, community partnerships, and student leadership development as mechanisms for sustaining club activities. Theoretically, the study contributes to the literature on teacher leadership and co-curricular program management, emphasizing the role of adviser agency and resourcefulness in sustaining science-related student organizations in resource-limited contexts. Practically, the findings underscore the need for stronger institutional support, dedicated funding, professional development programs, and enhanced stakeholder collaboration to strengthen science club operations in public elementary schools. These insights may guide school leaders, policy makers, and educators in designing sustainable strategies for improving co-curricular science engagement among elementary learners.

Keywords: science club operations, science education, co-curricular programs, phenomenology, elementary school advisers

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INTRODUCTION

Background of the Study

Science clubs provide valuable opportunities for students to explore scientific concepts beyond the formal classroom. Through hands-on activities, collaboration, and authentic investigations, students develop curiosity and inquiry skills while strengthening their interest in science, technology, engineering, and mathematics (STEM). In the Philippines, the Philippine Society of Youth Science Clubs reports that more than 100,000 youth members actively participate in science club activities nationwide, reflecting the increasing engagement of young learners in scientific learning (PSYSC, n.d.).

Science education in the country is currently guided by the MATATAG K to 10 Curriculum for Science (Grades 3–10) introduced by the Department of Education in 2024. While the curriculum aims to strengthen science instruction, it does not include specific provisions for the formal establishment and management of science clubs. Consequently, many schools implement science club initiatives through school-based plans and administrative memoranda aligned with the broader principles of the MATATAG curriculum.

Despite these efforts, national and international assessments reveal continuing challenges in science education. In the Programme for International Student Assessment (PISA), Filipino learners obtained an average science score of 357, significantly lower than the OECD average of 489. Only 22% of Filipino students reached the minimum level of scientific proficiency compared with 78% of students from OECD countries (Bernardo et al., 2023). These findings highlight difficulties in applying scientific concepts, interpreting data, and connecting scientific knowledge to real-world situations.

Science clubs are often viewed as a strategy to address these gaps by providing experiential and inquiry-based learning opportunities. However, their implementation is frequently affected by limited resources, insufficient adviser training, and heavy teaching workloads (Padayao & Arzadon, 2024). In addition, shortages of qualified science teachers and inadequate laboratory facilities in many public schools further affect both classroom instruction and science-related extracurricular programs (Caraig, 2022).

International research also highlights the benefits of science clubs in promoting students' engagement in science. Participation in science organizations has been linked to increased motivation, stronger scientific identity, and greater interest in STEM careers (Rethman et al., 2020). Collaborative and inquiry-based learning experiences further support the development of scientific thinking and problem-solving skills (Mercer & Howe, 2022; Webb et al., 2023). These outcomes align with constructivist learning theory, which emphasizes that knowledge is constructed through interaction, exploration, and meaningful experiences.

Despite these recognized benefits, existing studies largely focus on student outcomes and program impacts, with limited attention to the experiences of teachers who manage and sustain science club programs. Consequently, there is limited empirical understanding of how science club advisers plan activities, manage programs, address challenges, and sustain initiatives in public elementary schools, particularly in resource-constrained contexts (Öndeş et al., 2025). This gap restricts a deeper understanding of how science club programs operate at the school level.

In response, this study explores the lived experiences of science club advisers in selected public elementary schools. Using a phenomenological approach, the research examines how advisers plan activities, manage programs, address challenges, and facilitate student participation in science initiatives. By documenting these experiences, the study aims to provide insights that may help schools and education leaders improve the management and sustainability of science club programs. Strengthening these co-curricular initiatives may ultimately enhance students' engagement in science, develop inquiry skills, and promote interest in STEM among elementary learners.

OBJECTIVES OF THE STUDY

This study aimed to explore the operational dynamics of science clubs in selected public elementary schools, with a particular focus on the lived experiences of science club advisers.

Specifically, it sought to:

- a) Examine the current operational practices of science clubs in selected public elementary schools.
- b) Investigate the challenges experienced by Science Club advisers and other stakeholders in implementing club activities.
- c) Identify opportunities to strengthen the sustainability and effectiveness of Science Club operations.



LITERATURE REVIEW

Science Clubs in Basic Education

Science clubs provide important co-curricular opportunities, extending science learning beyond the classroom through inquiry, collaboration, and hands-on activities. In the Philippines, the Department of Education promotes science education by supporting school science clubs and teacher professional development. Initiatives such as the Professional Development and Science Club Partnerships Webinar Series bring together teachers, advisers, and students from public and private schools to share strategies for science enrichment (Department of Education, 2021). These efforts are reinforced through partnerships with the Philippine Society of Youth Science Clubs and the Science Club Advisers Association of the Philippines, especially during National Science Club Month.

Regional initiatives also demonstrate how national policies are implemented at the school level. Memoranda from Department of Education Region VIII outline participation guidelines, activity plans, and recognition programs for science club members during National Science Club Month (Department of Education Region VIII, 2024). These activities highlight the role of science clubs as teacher-supervised student organizations that promote collaborative projects, science competitions, and experiential learning to increase student engagement in science.

Empirical studies support the educational value of science clubs. Research at Bicol University found that regular science club meetings involving hands-on projects and environmental activities improve students' environmental responsibility and participation in scientific learning (Nuñez & Llenaresas, 2021). Similarly, science education studies indicate that science clubs promote inquiry-based learning, collaborative problem solving, and engagement with real-world scientific issues, strengthening students' curiosity, scientific reasoning, and interest in STEM fields.

Operational Challenges in Science Club Implementation

Despite their benefits, several studies highlight challenges affecting the sustainability of science club programs. Limited laboratory resources and equipment restrict opportunities for hands-on experimentation. Studies by UP Diliman (2023) and Caballes et al. (2024) reported deficiencies in laboratory infrastructure, including the absence of functional laboratories in many schools.

Other operational challenges involve limited institutional support and school resources. Hadji Abas and Marasigan (2020) reported that inadequate laboratory space, malfunctioning equipment, and unstable water and electricity supply reduce teachers' ability to conduct effective experiments. The Royal Society of Chemistry (2023) also noted that insufficient funding limits teachers' access to professional development and restricts students' exposure to inquiry-based science instruction.

Financial sustainability is another concern. Science Club Action Plans and Annual Implementation Plans from the Department of Education indicate that many programs rely on temporary funding or external partnerships. When funding ends, activities often slow down or discontinue (Department of Education, 2024). As a result, schools with limited resources tend to implement low-cost activities such as recycling projects or lecture-based demonstrations rather than sustained experimental investigations.

Teacher workload also affects science club implementation. Due to rigid curricular schedules and heavy teaching responsibilities, teachers often have limited time to implement inquiry-based approaches in regular classes. Consequently, science clubs become alternative spaces where teachers can introduce project-based and student-centered learning activities (Wieselmann, Sager, & Price, 2022).

Opportunities for Science Club Development

Despite these challenges, research highlights significant opportunities for science clubs to enhance student learning and engagement. Active learning strategies such as inquiry-based projects, collaborative discussions, and hands-on experimentation improve students' conceptual understanding and motivation in STEM subjects. Studies show that project-based learning approaches increase student engagement, academic performance, and scientific thinking skills (Liu, Zhang, & Kim, 2025).

Informal science learning environments, including science clubs, also play a key role in promoting students' science identity and interest in STEM. Participation in afterschool science clubs has been associated with stronger science identity and a greater sense of belonging among students (Hill et al., 2024). Meta-analytic evidence further shows that informal science education programs improve students' interest, attitudes, and motivation toward STEM disciplines (Xia et al., 2024). Community-based STEM clubs also provide collaborative learning environments where students develop teamwork, problem-solving, and real-world application skills (Velasco & Hite, 2023).



Government initiatives further support these efforts. Proclamation No. 264 designates September as National Science Club Month in the Philippines, encouraging schools to organize science-related activities that promote student engagement in scientific inquiry. School-based initiatives such as environmental projects, tree-planting activities, and waste-reduction campaigns demonstrate how science clubs connect classroom learning with real-world applications (DepEd Bataan, 2024).

Synthesis

The reviewed literature highlights the importance of science clubs as co-curricular programs that enhance student engagement in science through inquiry-based and collaborative learning. National initiatives from the Department of Education, along with programs organized by the Philippine Society of Youth Science Clubs, demonstrate strong institutional support for science clubs as platforms for developing students' scientific literacy and interest in science.

However, the literature also reveals significant challenges, including inadequate laboratory facilities, limited funding, and insufficient instructional resources that affect the sustainability of science club programs. Teacher workload and limited professional development opportunities further constrain the implementation of inquiry-based science activities.

Despite these constraints, research consistently shows that science clubs provide meaningful opportunities for active learning, collaboration, and the development of scientific thinking skills. Nevertheless, limited research has examined how science club advisers manage these programs and address operational challenges in public elementary schools. Understanding the experiences of science club advisers is therefore essential for strengthening the implementation and sustainability of science club programs in basic education.

METHODOLOGY

Research Design

This study employed a qualitative phenomenology approach to gain an in-depth understanding of the lived experiences of public elementary school Science Club advisers in the management and administration of science clubs. Phenomenology was selected for its capacity to explore participants' subjective perspectives and uncover the essential characteristics of their experiences with Science Club events, allowing the researcher to focus on meaningful, firsthand accounts of Science Club operations in real school contexts. The study employed purposive sampling, a non-probability method that intentionally selects participants who meet specific criteria relevant to the research objectives.

Participants of the Study

The study involved ten Science Club advisers from public elementary schools who had served as science coordinators for at least three consecutive years and had managed active Science Clubs. Advisers with less experience, limited involvement, or temporary reassignment were excluded. Demographic information, including years of service, educational background, grade levels supervised, and school characteristics, was collected to contextualize their experiences. Data were gathered through semi-structured interviews and document analysis. Interviews allowed in-depth exploration of roles, strategies, challenges, and successes, while document analysis of activity logs and program reports triangulated the data, enhancing credibility and rigor.

Research Instrument

The instrument used in this study was a self-developed interview guide with 12 open-ended questions. It was designed to collect the lived experiences of Science Club advisers through semi-structured interviews. This type of instrument supports a conversational flow and encourages detailed answers. It helps the researcher gain meaningful insights into the advisers' thoughts, feelings, and experiences, leading to a deeper understanding of the topic, as Patton (2020) discusses.

The development and implementation of the interview guide were informed by a careful review of relevant policy documents and literature, including the Department of Education's MATATAG K to 10 Curriculum: Science (Grades 3–10) (2024). Expert consultation was also sought from experienced science educators and qualitative research advisers to ensure that the questions aligned with the research objectives and the study's theoretical framework. This two-pronged approach enhanced the content validity of the instrument and ensured its appropriateness for the study context.

There are three main parts to the guide. The first part collects background information, such as the participant's current job, how long they have been a science coordinator, and basic facts about the school. The second part goes into more detail about how science clubs operate, including how they plan activities, involve students, collaborate with other teachers, and follow DepEd rules. The third part discusses problems, such as insufficient resources, insufficient training, students' lack of interest, and insufficient support from administrators. The last part explores ways to improve, such as new ideas, long-term strategies, and involving parents and other stakeholders.



Sample questions that prompt thorough reflection include: "What strategies have you used to increase student participation and sustain their interest in club activities?" "How do you address or overcome these challenges to keep the club active and engaging?" and "What practices or innovations would you recommend to other schools for making their science clubs more successful and impactful?" In addition, the question 'In what ways do you involve parents or guardians in supporting Science Club initiatives?' serves solely as a probing prompt to elicit deeper reflection during the interview and is not included in the formal research instrument.

The tool was reviewed by nine experts in the field. They evaluated the content using the approach introduced by C. H. Lawshe in 1975. Each expert rated every question as essential, useful, or unnecessary. Their ratings were assigned values and counted to identify which items were considered essential. Following the recommendations of Polit, Beck, and Owen (2007), items with a content validity ratio of 0.78 or higher were accepted. The formula used was $CVR = (N_e - N/2) / (N/2)$, where N_e was the number of experts who marked the item as essential and N was the total number of experts.

To ensure coding reliability, an external auditor listened to the audio recordings. This auditor acted as an independent coder. The researcher served as coder 1, and the auditor served as coder 2. A score of 1 was given when both coders agreed. A score of 0 was given when they disagreed. The researcher's codes served as the reference. Since all of the auditor's checks matched the researcher's codes, the agreement reached 100%.

As cited in McHugh (2012) and introduced by Cohen (1960), intercoder reliability was determined by Cohen's kappa. The formula employed was $k = (p_o - p_e) / (1 - p_e)$, where p_o denoted the observed agreement and p_e denoted the probability of agreement occurring by coincidence.

This instrument and validation process ensured that the questions were consistent with the study objectives and that the data collected from Science Club advisers were credible, reliable, and grounded in established research practices.

Data Gathering Procedure

Before gathering data, the researcher requested permission from the Schools Division Superintendent of Cadiz City Division to conduct the study "Science Club Operation: Challenges and Opportunities." The researcher also requested formal permission from the head teachers of the public elementary schools where the participants were assigned. The researcher collaborated with the designated Science Club advisers and provided a comprehensive explanation of the study's objectives after obtaining all necessary permissions.

The researcher clarified the voluntary nature of participation and analyzed the ethical principles that protect each participant's rights, privacy, and welfare. Before enrollment in the investigation, participants were required to sign written consent forms. This action adhered to the Data Privacy Act of 2012 (RA 10173) and institutional ethical standards.

Schedules were established with each adviser, in accordance with their preferred time and location, upon their consent. Interviews were conducted from August 11 to 22, 2025. These were conducted in person. Additionally, the researcher requested authorization to record the interviews in order to facilitate precise transcription.

The researcher visited each institution prior to conducting the interviews. This step enabled the advisers to become more acquainted with their work environment and provided a more comprehensive understanding of the operations of Science Club activities within each school. Each interview was conducted in a private, peaceful location to foster an environment conducive to candid, open communication.

The primary instrument for data acquisition was a semi-structured interview guide that had been validated. The researcher urged advisers to discuss their experiences, challenges, and opportunities in managing science clubs. To comprehend the significance of each response, the researcher meticulously observed verbal and nonverbal cues, including tone and pauses, throughout the interview. Each interview lasted an average of 30 minutes.

After collecting all interviews, the researcher transcribed the audio recordings verbatim. Transcripts were checked multiple times to ensure accuracy. The interviews were transcribed in the original language and subsequently translated into English to facilitate analysis while retaining the original meanings. Thematic analysis followed Creswell's (2014) data analysis spiral. This process involved organizing information, identifying patterns, and developing themes to present a clear picture of the lived experiences of Science Club advisers in managing Science Club operations in public elementary schools.

Data Analysis Procedure

The qualitative data were examined through a phenomenological approach. The researcher followed the six-step thematic analysis process described by Creswell (2014). Manual coding was done through Excel to organize responses, track patterns, and group emerging themes based on the lived experiences of Science Club advisers.



Organize and transcribe. The researcher reviewed all recorded interviews and transcribed each response word-for-word. Listening to and revisiting the audio helped ensure accurate reflection of adviser experiences in operating science clubs in public elementary schools.

Read or look at all the data. After transcription, the researcher read all the responses to understand the stories and experiences shared by the advisers. Notes were written to capture recurring ideas related to planning, student participation, resources, and support in Science Club operations.

Start coding all the data. The data were coded by the researcher, with short labels assigned to meaningful ideas and key statements highlighted. These codes encapsulated the advisers' perspectives on club activities, barriers, opportunities, and strategies. Similar codes were combined into clusters to create broader themes in Excel. This phase, in accordance with Miles et al. (2020), categorized the data to accurately reflect the field experiences.

Use the coding process to generate descriptions and themes. Themes were generated from the coded data to illustrate how advisers plan club activities, engage students, manage limited resources, collaborate with school leaders, and establish learning opportunities. The implementation of the science club was influenced by both positive practices and challenges, as evidenced by these themes.

Represent the narrative's description and themes. The researcher wrote the results in narrative form, presenting each theme with supporting statements from the advisers. The discussion highlighted real situations in schools, including funding limitations, a lack of materials, student motivation, teacher workload, and creative strategies used to sustain activities.

Interpretation of findings. The final stage focused on interpreting the themes' meanings in relation to Science Club operations in public elementary schools. The researcher reflected on what advisers went through and learned, pointing out how challenges changed their methods and how chances helped the Science Club grow and get students more interested in learning about science.

Data Trustworthiness

Qualitative research explores how individuals understand and interpret their personal experiences. According to Ritter, Hargittai, and Mullan (2023), it collects data through interviews, observations, and open-ended questions to capture authentic perspectives and interpretations. This study established trustworthiness by conforming to four essential criteria: credibility, confirmability, dependability, and transferability. These standards ensured that the results were correct, based on evidence, and useful beyond the study's immediate context (Ghanbar, Saeidi, & Rezaei, 2023).

To ensure credibility, member checking was conducted with Science Club advisers. Participants reviewed their interview transcripts and a summary of findings, suggested changes if needed, and clarified challenges (Subrahmanyam, 2025). A formal Synthesized Member Checking (SMC) report and validation letter were also provided. At the theme level, participants reviewed initial codes and themes after the first thematic analysis and confirmed that the grouped themes accurately represented their experiences, with no changes requested.

Confirmability ensured that the results reflected participants' perspectives rather than the researcher's. Following Marlina, Purwaningsih, and Al Hakim (2025), a clear audit trail was maintained, including interview recordings, transcripts, coding sheets, and notes on theme development. Dependability addressed the consistency of findings, with the research process systematically documented for replication (Díaz & Pérez, 2023). Intercoder reliability was assessed using the Perfect Agreement method, where an independent checker scored 1 for agreement and 0 for disagreement, achieving 100% agreement and confirming the reliability of coding and themes (Halpin, 2024). Transferability enhanced the applicability of findings to other schools or educational settings. Purposive sampling ensured advisers met specific qualifications and experience, and detailed participant and school context data were collected to support application of findings. This underscores the relevance of the study's insights into the challenges faced by Science Clubs in public elementary schools.

Ethical Considerations

Ethics tells us what is right and wrong in how individuals act. Sullivan and Smith (2021) said that the researcher is mainly responsible for keeping ethical standards. This study adhered to ethical principles by obtaining informed consent, protecting anonymity, maintaining confidentiality, and properly deleting data.

The researcher explained the study's purpose, goals, and process to all participants. Each participant was given an informed consent form to make sure they wanted to take part. The form had information about the study's purpose, how data would be collected, any risks and benefits, confidentiality, and the right to withdraw.



To protect anonymity, real names were not used. Participants were assigned codes instead of personal identifiers throughout the paper. This step helped protect their privacy and identity.

The data's privacy was fully safeguarded. The research files were kept safe, and only the researcher could get to them. People who were not allowed to could not get to audio recordings, transcripts, and notes. When the retention period was over, paper documents were shredded, and digital files were put in a folder that only people with a password could get to. These steps ensured that participants' data was safe and handled properly.

RESULTS AND DISCUSSION

Table 1

Demographic Characteristics of Science Club Advisers

Participant	Sex	Civil Status	Years as Science Club Adviser	Years in Current School	Grade Level Handled
P1	F	M	7	9	Grades 4–6 / Science
P2	F	M	13	16	Grade 6 / Science
P3	F	M	4	6	Grades 4–6 / Science
P4	F	M	8	8	Grades 4–6 / Science
P5	F	M	15	17	Grades 4–6 / Science
P6	F	M	7	7	Grade 6 / Science
P7	F	M	3	5	Grades 4–6 / Science
P8	M	M	4	6	Grade 4 / Science
P9	F	M	6	8	Grade 4 / Science
P10	F	S	7	12	Grades 4–6 / Science

Note. F = Female; M = Male; M = Married; S = Single.

The Participants

The study involved ten Science Club advisers with experience ranging from three to fifteen years, working with Grades 4 to 6. P1 (since 2022) focuses on students' interests, particularly robotics and academic competitions. P2 (13 years) handles Grade 6 and participates in various programs and competitions. P3 (4 years) conducts weekly experiments and environmental activities, showing science learning beyond the classroom. P4 (8 years) meets students twice a month, supporting competitions and collaborating on school-wide initiatives.

P5 (15 years) consistently organizes science activities across Grades 4–6. P6 (7 years) balances classroom teaching with club responsibilities, describing the role as rewarding yet challenging. P7 (3 years) expanded the club from Grade 6 to Grades 4–6, preparing students for science fairs. P8 (4 years) manages a Grade 4 club of 40–50 students with weekly hands-on experiments and community projects. P9 (6 years) conducts weekly activities to develop leadership and early science interest. P10 (7 years) manages large club groups, holds bi-monthly meetings, and supports students in competitions. Overall, participants demonstrated strong commitment to fostering science interest, confidence, and leadership, balancing club duties with classroom responsibilities.



Thematic Analysis

This section presents how the interview responses of Science Club advisers were organized into themes. The interview questions helped identify patterns, codes, and themes based on the participants' experiences. While an interview guide was used, follow-up questions and clarifications ensured that their insights were accurately understood.

Thematic Findings

All participants were licensed teachers serving as Science Club advisers in public elementary schools. To maintain confidentiality, each participant was assigned a code (e.g., P1, P2, P3). The themes reflect their shared experiences, challenges, strategies, and motivations in managing science club programs and activities, highlighting the realities of implementing science clubs in basic education.

Theme 1: Current Operational Practices of Science Club Advisers

The interviews revealed that Science Club advisers employ various strategies to sustain science-related activities despite limited time and resources. Many align club activities with the school calendar by integrating science themes into environmental programs, competitions, and community outreach initiatives.

When laboratories or funding are limited, advisers rely on improvised materials, recycled items, and ICT tools to conduct experiments and demonstrations. They also collaborate with school administrators, PTAs, and local partners for support while encouraging student officers to take leadership roles in club activities. These practices demonstrate the creativity and dedication of science club advisers in managing programs within existing school systems.

Five sub-themes emerged: (1) Program Planning and Activity Scheduling, (2) Utilization of Available and School-Based Resources, (3) Administrative Coordination and Compliance, (4) Student Engagement and Participation Management, and (5) Balancing Instructional and Co-Curricular Roles.

1.1 Program Planning and Activity Scheduling

Advisers reported that science club activities are often scheduled based on the school calendar and students' availability. Many integrate club initiatives with existing programs such as science fairs, environmental campaigns, and community projects to avoid overwhelming students.

Teachers explained:

“For the club, we meet only two times a month. I give simple science activities.” (P4)

“I coordinate weekly after-school meetings for about 30 minutes and supervise small hands-on experiments and environmental projects.” (P3)

“We conduct meetings every Friday to prepare for activities, especially during district and division science fairs.” (P7)

These responses show that advisers adopt flexible planning strategies that fit their teaching schedules and school programs. This supports the findings of Núñez and Llenaresas (2021), who emphasized that science clubs are more effective when integrated into existing school activities. The results suggest that clearer yet flexible guidelines, scheduled club time, and training on activity planning could help advisers implement programs more consistently.

1.2 Utilization of Available and School-Based Resources

Most advisers acknowledged that science club activities are conducted using available school resources. Improvisation and creativity are common practices in maintaining club operations.

Participants shared:

“When we lack equipment, we conduct experiments using available materials and ICT tools such as videos.” (P2)

“The biggest constraints are funding, materials, limited space, and teachers' workload.” (P3)

“I bought robotics kits for the students so they could join competitions.” (P1)

These experiences show that advisers rely heavily on resourcefulness to sustain science activities. Padayao and Arzadon (2024) similarly found that teachers in resource-limited schools depend on improvisation and digital tools to support science learning.



These findings suggest that stronger institutional support, including funding, equipment, and designated laboratory spaces, would improve the implementation of science club programs.

1.3 Administrative Coordination and Compliance

Managing a science club also involves administrative coordination with school leaders and external stakeholders. Advisers frequently collaborate with principals, PTAs, and community partners to secure resources and support.

Participants noted:

“We collaborate with the PTA and barangay for sponsorships or donations.” (P8)

“I plan to tap local government units and other partners for financial support.” (P2)

“Most of the tasks are assigned to me since I am the adviser.” (P6)

While these partnerships help sustain activities, administrative responsibilities also increase advisers' workload. The Department of Education (2021) encourages schools to collaborate with community partners to strengthen co-curricular programs. However, the findings suggest that clearer structures and shared responsibilities could help distribute administrative tasks more effectively.

1.4 Student Engagement and Participation Management

Maintaining student engagement is another key responsibility of science club advisers. They organize activities such as competitions, environmental campaigns, and outreach programs to motivate students.

Teachers shared:

“Sometimes it is difficult to keep students actively involved because they have many other school activities.” (P10)

“Many members are also part of other organizations, so there are schedule conflicts.” (P1)

“We train students on environmental awareness and disaster preparedness.” (P4)

Despite these challenges, advisers continue to develop meaningful activities that encourage participation. Webb, Drane, and Brown (2023) found that hands-on extracurricular programs strengthen students' scientific identity and motivation, particularly when activities are relevant to real-life contexts.

1.5 Balancing Instructional and Co-Curricular Roles

Many participants described the challenge of balancing their teaching responsibilities with science club duties. Advisers often dedicate additional time beyond regular teaching hours to manage club activities.

Teachers stated:

“Handling my time is challenging because aside from teaching, I also fulfil my duties as a science club adviser.” (P6)

“During science fair preparation, I often go home late and work on weekends.” (P1)

“Adviser fatigue is real because club work is usually done outside regular hours.” (P3)

These experiences reflect the heavy workload often faced by public school teachers. Padayao and Arzadon (2024) reported that teachers frequently manage multiple roles without additional incentives, which may lead to work strain. Recognizing advisory roles within the official teaching workload or providing incentives could help sustain teacher commitment and reduce burnout.

Overall, the findings show that science club advisers demonstrate creativity, dedication, and resilience in sustaining club activities. They plan activities around limited time, utilize available resources, collaborate with stakeholders, and encourage student participation while fulfilling their teaching responsibilities. These practices highlight the crucial role advisers play in maintaining science clubs as spaces that promote curiosity, hands-on learning, and student engagement in science.

Theme 2: Challenges Encountered by Science Club Advisers

Science club advisers face multiple obstacles—limited funds, inadequate laboratory space, and insufficient materials—often relying on personal resources. These challenges stem from systemic issues, including policy gaps, rigid funding, staffing



shortages, excessive documentation, and overlapping responsibilities, which reduce advisers' ability to focus on club activities. Limited stakeholder support and student participation due to financial or scheduling conflicts further shape advisers' struggles.

Five sub-themes emerged: (1) Financial and Material Constraints, (2) Time and Workload Management, (3) Stakeholder and Collegial Support, (4) Student Participation and Equity, (5) Facility and Safety Limitations.

2.1 Financial and Material Constraints

A major challenge was the lack of funding and materials. Advisers shared:

"We cannot expect financial support. Some students are less fortunate, but the school, teachers, and community try to help. I bought robotics kits myself so students could compete without burdening parents." (P1)

"The biggest constraints are funding, materials, limited space, and teacher workload." (P3)

"School funds are not instant. Often, we use our own money to carry out activities; otherwise, students miss out." (P6)

These constraints prevent students from doing authentic experiments and reflect national trends linking limited lab access to low student performance (Bernardo et al., 2023). Improving financial support, access to materials, and dedicated budgets would allow more equitable and meaningful science experiences.

2.2 Time and Workload Management

Teaching, paperwork, and club duties often compete for advisers' time:

"Handling classroom instruction and science club duties is hard; managing time is a big challenge." (P6)

"I often work late and sacrifice personal time because there is no additional help." (P1)

"Classroom teaching and paperwork take priority, so club work happens outside hours, causing adviser fatigue." (P3)

"With retired co-teachers and no replacements, workload is heavy, limiting focus on the club." (P2)

Heavy workloads hinder the sustainability of science enrichment programs and contribute to burnout, which affects both instruction quality and program continuity (Hadji Abas & Marasigan, 2020).

2.3 Stakeholder and Collegial Support

Support from colleagues and stakeholders is limited:

"Co-teachers also handle multiple tasks, so most club responsibilities fall on me." (P6)

"To expand the club, I seek support from the principal, PTCA, NGOs, and other clubs for training and collaboration." (P7)

Stronger collaboration with teachers, parents, and community partners can improve resources, program sustainability, and student outcomes (DepEd, 2021; DepEd Region VIII, 2024). Currently, advisers often manage programs alone, reducing efficiency and limiting opportunities for innovation.

2.4 Student Participation and Equity

Participation is limited by financial constraints and overlapping club commitments:

"Many students are in other clubs and cannot always join. Financially less fortunate students rely on school and community support." (P1)

"We cannot impose many activities since students are involved in multiple clubs." (P6)

"Keeping students interested is hard when they have other activities and resources are limited." (P10)

This affects engagement and meaningful science experiences. Ensuring equitable participation is essential for building students' science identity and skills (Webb, Drane, & Brown, 2023).

2.5 Facility and Safety Limitations

Limited laboratory space and resources constrain hands-on learning:



"We rely on DepEd equipment; there is no dedicated lab, only classrooms." (P2)

"The main problems are funding, materials, limited time and space, and lack of science rooms." (P7)

"Funding, materials, and limited experiment space are the biggest constraints." (P3)

Without proper facilities and safety tools, both science instruction and student experimentation are affected (UP Diliman, 2023; Caballes et al., 2024; Hadji Abas & Marasigan, 2020). Schools need safe, well-equipped spaces to implement effective science programs.

Theme 3: Opportunities for Science Club Advisers

Despite challenges, participants found meaningful opportunities that strengthened their commitment as science club advisers. These opportunities highlighted their creativity, persistence, and ability to turn limitations into valuable student learning experiences.

3.1 Resourcefulness, Innovation, and Sustainability

Advisers demonstrated resourcefulness and innovation to sustain programs despite limited materials and funding:

"I use low-cost or locally sourced materials and plan inquiry tasks that require minimal consumables." (P3)

"When experiments are lacking, we improvise with available equipment and encourage students to create instruments. We also use videos and conduct activities in the classroom." (P2)

"I try to show real-world scenarios so students see that science applies beyond lessons, fostering future interest." (P3)

These approaches foster creativity, practical problem-solving, and persistence, proving that meaningful science learning does not require expensive equipment.

3.2 Partnership and Community Support

Collaboration with community and local stakeholders provided additional resources and support:

"I plan to tap LGUs and capable individuals for financial help and equipment donations." (P2)

"We collaborate with the PTA and barangay for sponsorships, and coordinate with the division office for resources and occasional training." (P8)

"We set aside funds, hire a co-advisor, and work with colleges to strengthen partnerships and track students' interest in science." (P10)

These partnerships enable students to access advanced methods, share resources, and expand school-based programs into community-supported initiatives (DepEd, 2021; DepEd Region VIII, 2024).

3.3 Student Leadership and Engagement

Empowering students to take leadership roles enhanced engagement and sustained activities:

"Training student leaders to run sessions develops their confidence and showcases scientific skills." (P2)

"Students act as leaders in projects aligned with the curriculum and community issues, like DRRM." (P4)

"I let student leaders handle some tasks to lessen my workload." (P10)

Student-centered leadership strengthens science identity, promotes teamwork, and ensures program continuity even when advisers' time is limited (Webb, Drane, & Brown, 2023; Saleh & Fitria, 2020).

3.4 Professional Growth and Collaboration

Serving as advisers fostered professional growth and collaboration:

"Division trainings enhance our content knowledge and pedagogy, which helps us carry out club activities." (P6)

"We coordinate with DRRM to align activities with the curriculum." (P4)



Collaboration, networking, and shared advocacy extend learning beyond formal training, improving instructional skills and enriching club management (Nuñez & Llenaresas, 2021).

3.5 Motivation and Fulfilment

Advisers derived personal fulfilment from student growth:

"You give students experiences they remember and learn from, even if they don't win competitions." (P6)

"Whether or not we pass the competition, it's a great experience for my students to see other kids and their robots." (P1)

These reflections highlight the emotional and professional satisfaction advisers gain, supporting Vygotsky's Sociocultural Theory that learning occurs through social interaction (Webb, Drane, & Brown, 2023).

Overall, science clubs represent spaces of possibility where advisers and students can explore science, develop leadership, and find motivation and purpose beyond the classroom.

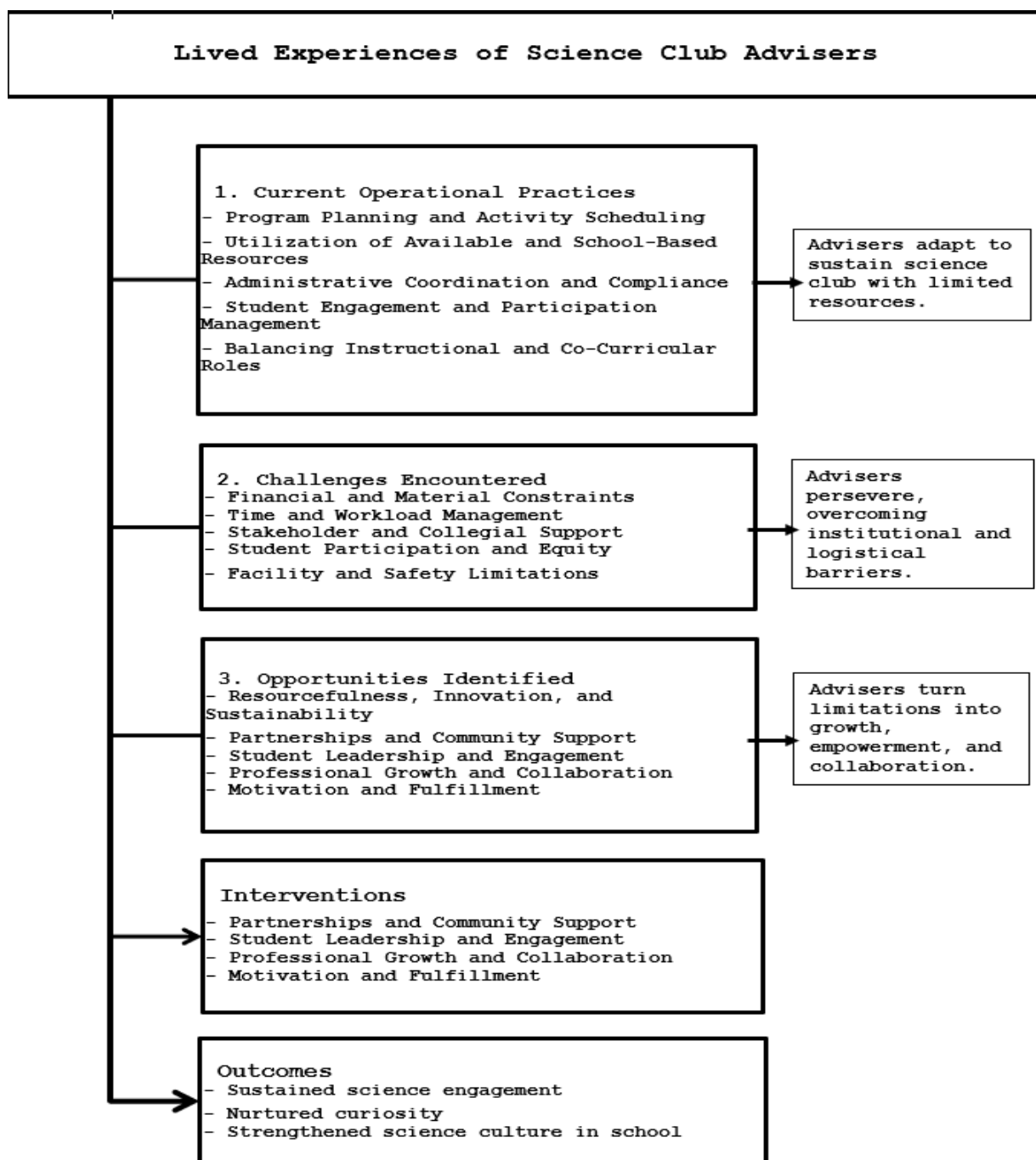


Figure 1. Simulacrum Diagram



The figure above presents the simulacrum diagram that outlines the flow of this study. It illustrates how Science Club advisers handle their day-to-day responsibilities while navigating challenges, adapting to situations, seeking help when needed, and working toward clear goals for their learners. Their work centers on a strong commitment to supporting science learning, even with limited resources, heavy workloads, and uneven support from the school community.

Advisers continue moving forward through practical action. These efforts help maintain student interest in science and sustain meaningful club activities. Their consistency builds a science-supportive environment, encourages student curiosity, and strengthens science programs through real experience, cooperation, and shared responsibility.

CONCLUSION

Summary of Findings

This study explored the lived experiences of public elementary school Science Club advisers in managing and administering Science Clubs, focusing on their operational practices, challenges encountered, and opportunities identified. The findings are organized into three major themes that directly respond to the research objectives.

First, under current operational practices, advisers described structured approaches to managing Science Clubs. They aligned activities with the school calendar, held regular meetings, and integrated science projects into school and community events. Limited resources led them to use improvised, recycled, or locally available materials. Collaboration with administrators, parent-teacher associations, and community stakeholders provided logistical and material support. Advisers also involved student officers in planning and implementation, fostering leadership and shared responsibility. These practices highlight advisers' adaptability and collaborative efforts in sustaining Science Club activities.

Second, regarding challenges encountered, advisers reported recurring constraints affecting club implementation. These included insufficient funding, lack of laboratory facilities and science equipment, limited time due to teaching workloads and administrative tasks, and inconsistent stakeholder support. Student participation was sometimes affected by financial limitations and scheduling conflicts. These challenges influenced how advisers structured activities and required them to continuously adjust plans to maintain program continuity.

Third, in terms of opportunities identified, advisers described how constraints became catalysts for creativity and innovation. Limited resources encouraged problem-solving and improvisation. Support from parents, local government units, and community partners strengthened some initiatives. Professional development opportunities and peer collaboration enhanced advisers' skills and confidence. Encouraging student leadership also increased engagement and ownership. Advisers expressed fulfillment when observing improvements in students' curiosity, confidence, and motivation toward science learning.

Overall, the findings indicate that Science Club management involves sustained commitment, adaptive strategies, and collaborative practices within resource-constrained school environments.

This study concludes that the lived experience of public elementary school Science Club advisers is characterized by adaptability, persistence, and collaborative engagement in sustaining co-curricular science programs. In directly addressing the research objectives, the findings confirm that advisers employ structured operational strategies, navigate consistent institutional challenges, and transform constraints into opportunities for innovation and growth.

Science Club advisers function not merely as activity organizers but as facilitators of experiential science learning. Their role involves planning, resource mobilization, student leadership development, and continuous adjustment to contextual limitations. While inadequate funding, limited facilities, and heavy workloads present ongoing barriers, advisers sustain programs through creativity, initiative, and stakeholder collaboration.

Theoretically, this study contributes to the understanding of teacher leadership and experiential learning within co-curricular contexts. By documenting advisers' lived experiences, the research reinforces phenomenological perspectives that emphasize meaning-making in professional roles. It also extends discussions on informal and school-based science enrichment by illustrating how educators construct supportive learning environments despite structural limitations.



However, the study has limitations. The use of purposive sampling and a small sample size of ten participants limits generalizability. The research was confined to one Schools Division, which may not represent other educational settings. Additionally, reliance on self-reported interview data may reflect subjective perceptions. Future research may include multiple divisions, comparative school contexts, or additional data sources such as observations and document analysis to broaden understanding.

In conclusion, Science Club advisers play a significant role in fostering scientific curiosity and engagement among elementary learners within the context of public elementary schools in the studied division. Their experiences highlight both the systemic challenges affecting co-curricular science programs and the potential of committed educators to sustain meaningful learning opportunities within existing constraints.

RECOMMENDATIONS

Based on the findings that Science Club advisers sustain programs primarily through adaptability, collaboration, and personal initiative despite persistent challenges in funding, facilities, and workload, several evidence-based recommendations are proposed.

For policymakers and the Department of Education, it is recommended to institutionalize a standardized Science Club framework for elementary schools. This framework should include clear operational guidelines, safety protocols, and annual activity plans to ensure consistency across schools. A dedicated funding allocation through the Maintenance and Other Operating Expenses (MOOE) or a co-curricular budget should support experiments, materials, and participation in science competitions. In addition, annual professional development programs should be conducted at the division level to strengthen advisers' skills in low-cost laboratory activities, safety management, mentoring student research, and developing student leadership. Establishing a division-wide community of practice among Science Club advisers may also encourage the sharing of best practices and instructional resources.

For school leaders and administrators, Structured institutional support is essential for Science Clubs. Objectives should be integrated into the School Improvement Plan (SIP) and Annual Implementation Plan (AIP) to secure funding and align activities with school goals. Administrators may assign co-advisers or form a small support committee to share responsibilities, especially during large events or competitions. Implementing a quarterly planning and monitoring system is recommended. Schools should formalize partnerships with LGUs, NGOs, and private institutions for sponsorship and materials. Recognition systems for advisers and student members, such as awards or inclusion in performance evaluations, can strengthen motivation and institutional support for science programs.

Science Club advisers are encouraged to adopt more systematic management practices to enhance sustainability. Developing a structured annual action plan with defined objectives, timelines, budgeting projections, and evaluation indicators can improve program organization. Strengthening student leadership structures through clearly defined roles, leadership training sessions, and succession planning will help ensure continuity. Advisers may also maintain a resource inventory and sustainability plan that identifies reusable materials, potential donors, and alternative low-cost experimental approaches. Continuous professional development in inquiry-based and project-based science learning is recommended to enhance facilitation skills.

Parents and community stakeholders can contribute more sustainably through structured engagement mechanisms. Schools may establish a Science Club Support Committee composed of parents and community representatives to assist in planning and resource mobilization. Developing formal sponsorship proposals outlining material needs and projected outcomes can strengthen external partnerships. Inviting STEM professionals from the community as guest speakers or mentors can further enrich student exposure to real-world scientific applications.

Due to the study's limited sample and scope, future research should explore Science Club implementation more broadly. Longitudinal studies could assess impacts on students' academic performance, scientific identity, leadership, and STEM aspirations. Comparative studies across school types and contexts may reveal differences, while mixed-method designs can strengthen triangulation. Including perspectives of students, parents, and administrators and replicating the study at the secondary level can provide a more comprehensive understanding of Science Club effectiveness.



Overall, these recommendations emphasize structured institutional support, systematic administrative mechanisms, sustained professional development, and expanded research inquiry to strengthen the sustainability and impact of Science Clubs in public elementary schools.

Conflict of Interest

The author declares that there are no financial or personal relationships that could in any way influence or bias the content of this work.

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