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BARANGAY HIGH SCHOOL TEACHERS' EXPERIENCES IN TEACHING LABORATORY SCIENCE: BASIS FOR POLICY RECOMMENDATION

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ABSTRACT

This qualitative phenomenological study explored the lived experiences of barangay high school teachers in teaching laboratory science. The six participants were mostly early-career science teachers, with an average age of 29 years, and the majority were female. Most held entry-level positions, and their teaching experience ranged from one to eight years, reflecting varying familiarity with science instruction. Most had science-related degrees, while one held a degree in English, and their educational attainment ranged from the baccalaureate to the master's level, indicating diverse academic preparation that may influence teaching competence and professional development. Their experiences in teaching laboratory science were described as fun and enjoyable, meaningful, and challenging yet rewarding. The challenges they encountered included inadequate laboratory equipment and materials, limited laboratory facilities, and unprepared learners. To cope with these challenges, teachers used strategies such as the improvisation of materials, collaborative learning and group work, the use of technology and simulations, and advance preparation and strategic planning.

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INTRODUCTION

Science education held a crucial role in developing learners' scientific literacy, as well as enhancing their critical thinking and problem-solving abilities. Central to this process is laboratory science instruction, which offers students experiential learning opportunities through hands-on activities that bridge theoretical concepts with practical application.

However, the effective implementation of laboratory science in high school settings continues to be a complex educational concern, particularly in contexts where resources, training, and support systems are inconsistent.

Recent qualitative studies reveal that teachers' lived experiences are essential in understanding the realities of classroom and laboratory instruction. For example, Rosas (2025) explored the lived experiences of junior high school science teachers implementing the spiral progression approach, noting that participants encountered difficulties such as limited learning resources and challenges in preparing lessons outside their specialized science subjects, highlighting deep instructional strains that shape daily practice. Similarly, Monta & Perdio (2025) investigated science teachers' experiences in laboratory-based instruction in public schools in Bataan, Philippines, and found that resource limitations, lack of professional development, administrative support gaps, and time constraints were significant factors influencing teachers' capacity to conduct meaningful laboratory activities.

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These findings echo broader educational research that positions teachers not merely as implementers of curriculum but as interpretive agents whose experiences deeply influence instructional practice and student learning outcomes.

Studies conducted within the Philippine educational context underscore persistent barriers that affect science teaching, especially in laboratory contexts.

A recent local study documented high school teachers' experiences and self-assessment while teaching biology, illustrating the ongoing need to understand teachers' perceptions and instructional reflections as part of strengthening science education.

Qualitative inquiry, particularly phenomenological approaches, has been widely used to capture the depth and nuance of teachers' experiences, allowing researchers to name, categorize, and interpret lived realities within educational practice.

Phenomenology enables insights into individual meaning-making and shared instructional phenomena, thus offering rich data for evidence-based policy recommendations.

Despite these contributions, the specific experiences of barangay high school teachers teaching laboratory science—a setting that often represents the frontlines of basic science education—remain underexplored.

Barriers such as insufficient laboratory facilities, limited access to science equipment, and lack of ongoing training and support may uniquely shape teachers' instructional choices and professional perceptions.

Teachers' narratives can illuminate how such factors affect not only their practice but also students' engagement with scientific inquiry and learning.

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Understanding these lived experiences is especially urgent given the heightened role of science education in national development goals, including fostering scientific literacy, enhancing STEM readiness, and improving educational equity across diverse school contexts. By documenting and analyzing teachers' experiences, this study aspired to contribute grounded, context-sensitive insights that can inform policy recommendations aimed at strengthening laboratory science instruction in barangay high schools, ultimately improving learning outcomes and professional support structures.

MATERIALS AND METHODS

Research Methodology

This chapter presents the research method, research design, participants of the study, data-gathering procedures, research instrument, and data analysis used in this study. The purpose of this study is to explore the lived experiences of barangay high school teachers in teaching laboratory science and to use these experiences as a basis for policy recommendation.

Research Method

The research method employed in this study was the descriptive method within the framework of qualitative research, utilizing in-depth interviews as the primary data collection technique.

The descriptive research method focuses on systematically describing a phenomenon as it exists in its natural setting, without manipulating variables. According to Elliott (2025), it

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aims to provide an accurate portrayal of current conditions, practices, or relationships within educational settings, enabling researchers to understand trends, patterns, and implications for practice. This approach is particularly useful in educational studies that seek to document and analyze real-world events, behaviors, or perceptions without altering the environment in which they occur (Elliott, 2025).

During the interview, the interviewer and the interviewee were allowed to sit together at a distance and reflect on a series of questions regarding a specific issue. The purpose was to capture the main or essential perspectives of the participants on a particular matter within a social context through their responses to the questions.

Research Design

The study employed a phenomenological research design. Phenomenology is considered a philosophical approach to conducting qualitative research. The goal of phenomenology was to understand how individuals perceive the world and how these perceptions may differ from commonly held views by focusing on a person's subjective interpretations of their experiences. Phenomenology was carried out by interviewing the subjects to learn about their impressions and was frequently applied in fields such as psychology, sociology, and social work.

Phenomenology concentrated on examining the structures of consciousness as they were experienced from a first-person perspective. The central aim of phenomenology was to investigate and describe phenomena exactly as they were consciously experienced, without

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relying on theories to explain their causes or being influenced by unexamined preconceptions (Biemel & Spiegelberg, 2024).

Participants of the Study

In this study, participants were six (6) barangay high school teachers who are currently teaching laboratory science subjects from the district of Lambunao East.

These participants must be a science teacher currently teaching in the District with permanent status. They have at least one year of experience in teaching laboratory science. They must be willing to participate in an interview and share their experiences.

Sampling Design

The study employed a purposive sampling design. According to Nikolopoulou (2023), purposive sampling is a type of non-probability sampling technique in which units are selected because they possess specific characteristics needed for the study. In other words, the units are chosen deliberately or "on purpose." This method is also referred to as judgmental sampling, as it relies on the researcher's judgment to identify and select the individuals, cases, or events that are most likely to provide the relevant information necessary to achieve the study's objectives.

Research Instrument

The research instrument used in the study was a researcher-made interview schedule.

In research methodology, an interview schedule is a written list of pre-planned questions—structured, semi-structured, or open-ended—designed to guide the interviewer in collecting information consistently from participants. It serves as a standardized tool for data

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collection, ensuring that the same topics and questions are addressed in all interviews to support systematic comparison and analysis. The interviewer followed the schedule during face-to-face, telephone, or electronic interviews, asking each participant the predetermined questions and recording their responses (Socio.health, 2024).

The interview schedule is composed of (2) parts focusing on the purpose of the study.

Part 1, demographic profile of the participants, which captures the details such as the name, which is optional, age, sex, civil status, teaching position, grade level assignment, years in service as science teacher and educational qualification.

Part 2, Interview guide which is composed of 3 questions focusing on the experiences of teachers in teaching laboratory science, the challenges they encountered in teaching laboratory science, and the strategies used by teachers in coping with the challenges.

Voice and video recorders were also used for data collection and documentation, depending on the consent of the participants.

Validity of the Research Instrument

Before determining the validity of the researcher-made interview schedule, the instrument was first reviewed by the researcher's adviser and the Dean of the Graduate School. Subsequently, a panel of jurors, selected for their expertise in research, testing and assessment, and English, was asked to validate each question. Their feedback was used for careful review and necessary modifications to ensure the instrument's validity.

Validity refers to the extent to which the findings, interpretations, and conclusions derived from a study are accurate, meaningful, and appropriate in representing the concept

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being examined. It ensures that the research instrument truly measures what it is intended to measure and that the results are credible reflections of reality. In establishing content validity, the questions and format of the instrument must align with the study's defined variables and objectives to guarantee that each item accurately reflects the construction under investigation. This process often involves expert review to determine whether the items are relevant, clear, and representative of the concepts being studied. By ensuring that the content and structure of the instrument are consistent with the study's framework, researchers enhance the accuracy and usefulness of the data collected in relation to the research objective (Creswell & Creswell, 2023).

Comments, corrections, and suggestions provided by the panel of validators regarding the interview schedule were carefully considered, following the appropriate criteria established by Good and Scates (1972), as cited by Soqueña (2021).

Data Gathering Procedures

Permits were obtained from the adviser, the Dean of the Graduate School, the Office of the Schools Division Superintendent, the Office of the District Supervisors, the School Heads, and the individual participants to allow the researcher to conduct the study.

The researcher personally visited the schools, communities, or locations convenient for the participants to carry out the interviews. The researcher encouraged the participants to sign a waiver or permission form concerning their participation in the study.

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Using in-depth interviews, voice and video recorders were also utilized to fully capture the participants' responses. After completing the series of interviews, the researcher consolidated all collected data for further analysis.

Data Analysis

The data were collected through the interview schedule that were analyzed using thematic analysis, a qualitative method designed to identify, interpret, and report recurring patterns or themes within narrative data. This approach enables the researcher to uncover meaningful insights into the responses of the participants on their profile as Science Teachers, their experiences in teaching laboratory science, the challenges they encountered teaching laboratory science, and the strategies used by teachers in coping with the challenges.

According to Braun and Clarke (2023), thematic analysis provides a flexible yet rigorous framework for analyzing qualitative data, allowing researchers to identify both explicit and implicit meanings across participants' narratives. It was particularly suitable for educational research that aimed to understand complex social and organizational dynamics. Nowell et al. (2021) further emphasized that thematic analysis enhanced transparency and credibility in qualitative studies by ensuring a systematic approach to coding and interpreting data.

The transcribed data from the interviews were analyzed using Thematic Analysis (Braun & Clarke, 2023), which was well-suited for identifying, analyzing, and reporting patterns (themes) within qualitative data.

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The analysis followed the standard six-phase process. (1) Familiarization with Data: The researcher read and re-read the interview transcripts, both in the local language and their English translations, to become thoroughly familiar with the content; (2) Generating Initial Codes: Short phrases or labels were assigned to meaningful segments of data, such as "shared phone," "fear of judgment," and "poor signal," to highlight significant points; (3) Searching for Themes: The initial codes were grouped into potential overarching themes and sub-themes that captured recurring patterns; for example, codes like "no insult" and "private correction" were combined under a theme representing a broader concept; (4) Reviewing Themes: The researcher refined and checked the identified themes against the entire dataset to ensure they accurately reflected the participants' intended meanings and aligned with the focus of the study; (5) Defining and Naming Themes: Clear, concise, and academically sound names were developed for the final emergent themes, which were later presented in Chapter 4; and (6) Producing the Report: The researcher integrated the themes, supported by direct quotes from participants, into the narrative structure of the data presentation, analysis, and interpretation in Chapter 4, while linking the findings to the theoretical framework.

RESULTS AND DISCUSSIONS

This study sought to examine the lived experiences of barangay high school teachers who taught laboratory science in the Lambunao East District during the 2025–2026 school year. A qualitative phenomenological research design was utilized, involving six teachers as participants. Data were gathered through a researcher-made interview questionnaire, which

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underwent validation by a panel of experts using the criteria established by Good and Scates (1972), as cited by Soqueña (2021). The researcher secured the necessary permits from the appropriate authorities and conducted in-depth interviews at locations that were convenient for the participants. The collected data were then consolidated, analyzed, and interpreted using a thematic approach to extract significant insights from the participants' experiences.

The following were the findings of the study:

The six participants were mostly early-career science teachers, with an average age of 29 years, and the majority were female. Most held entry-level positions, and their teaching experience ranged from one to eight years, reflecting varying levels of familiarity with science instruction. Most had science-related degrees, while one held a degree in English, and their educational attainment ranged from the baccalaureate to the master's level, indicating diverse academic preparation that may affect teaching competence and professional development.

Based on the results of the in-depth interviews with the participants, it was found that the experiences of teachers in teaching laboratory science were fun and enjoyable teaching experiences, meaningful learning experiences, and challenging but rewarding teaching experiences.

It was also found that the challenges they encountered in teaching laboratory science included inadequate laboratory equipment and materials, limited laboratory facilities, and unprepared learners.

The strategies used by teachers in coping with the challenges in teaching laboratory science, based on the results of the in-depth interviews with the participants, included the

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improvisation of materials, collaborative learning and group work, the use of technology and simulations, and advance preparation and strategic planning.

Based on the findings, the following insights were drawn:

The participants are mostly early-career, entry-level science teachers, predominantly female, with varying teaching experience and academic backgrounds. Their youth and enthusiasm support innovative teaching and student engagement, but differences in experience and qualifications may affect their confidence, content mastery, and pedagogical competence, thereby highlighting areas for professional development.

Teaching laboratory science offers teachers a dynamic and engaging professional experience. It allows them to interact closely with students, facilitate hands-on learning, and observe students' curiosity and understanding develop in real time, which contributes to a sense of fulfillment and professional satisfaction. At the same time, this practice requires careful planning, problem-solving, and adaptability to navigate challenges such as limited resources, varying student preparedness, and complex experiments.

Teaching laboratory science in these schools is often hindered by limited equipment, inadequate facilities, and students' unfamiliarity with laboratory procedures, which restrict hands-on learning and active participation. These challenges require teachers to be creative, plan strategically, and provide extra guidance to ensure meaningful engagement with scientific concepts.

Teachers employ a variety of adaptive approaches to maintain effective science instruction despite the challenges they face. These strategies enable them to sustain student

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engagement and facilitate understanding of complex concepts. Thoughtful planning and anticipation of potential obstacles further allow teachers to maximize instructional time and ensure that learning objectives are met. Collectively, these practices reflect resilience, flexibility, and a commitment to providing meaningful, hands-on learning experiences even in resource-constrained environments.

CONCLUSION

Taking into account the findings and insights that have emerged in this study, the following recommendations are proposed:

Targeted professional development programs should be provided to support early-career science teachers in strengthening their content knowledge, pedagogical skills, and classroom management strategies. Mentorship opportunities with experienced educators, workshops on laboratory instruction, and collaborative learning communities may help bridge gaps in experience and qualifications, enhance confidence in teaching, and promote the effective implementation of innovative and engaging science lessons.

Teachers should be provided with training and support to enhance their planning, problem-solving, and adaptive teaching skills in laboratory settings. Providing access to practical resources, structured lesson guides, and collaborative planning sessions may help teachers manage challenges effectively, maximize student engagement, and ensure that hands-on learning remains meaningful and rewarding.

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Schools should improve access to laboratory equipment and facilities while also providing teachers with training on how to prepare students for laboratory activities. Supplementing limited resources with improvised materials, guided demonstrations, and step-by-step orientations may help students gain confidence and actively participate, ensuring that hands-on learning remains safe, engaging, and effective.

Teachers should be supported in developing adaptive teaching strategies through professional development programs focused on resourceful instruction, lesson planning, and the use of technology or alternative materials. Encouraging collaboration among teachers and the sharing of best practices may further enhance resilience and flexibility, enabling them to provide consistent, meaningful, and engaging laboratory experiences even in resource-limited settings.

For policymakers, the study recommends the formulation of policies that provide equitable access to laboratory resources for all barangay high schools and the implementation of professional development programs focused on laboratory pedagogy, safety, and innovation. Partnerships with universities, industries, and NGOs may further support resource-limited schools by providing equipment, training, and technical assistance.

Future research may explore students' perspectives on laboratory science experiences, assess the impact of hands-on teaching on academic performance and interest in science, and evaluate the long-term effects of policy interventions on laboratory teaching and learning outcomes.

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