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Innovative Science Instructional Tools for Optimal Learning Outcomes

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ABSTRACT

This research aimed to evaluate the utilization of innovative instructional tools for teaching Science 4 at Garcia Elementary School and investigate their correlation with teachers' competence and learners' academic performance. The study utilized a descriptive-correlational research design and gathered data through an adapted and modified questionnaire. The demographic and professional characteristics of the teachers (age, gender, civil status, highest educational attainment, years of service, and professional development) and the learners' age and gender were considered. The study assessed the extent of utilization of instructional tools in four categories: foundational, digital and technology-enhanced, interactive and student-centered, and experiential and hands-on. It also examined teachers' competence in instructional goals, big ideas, investigations, resources, ideas, explanations, and models, and learners' academic performance in specific Science 4 competencies. The findings showed that most teachers were between 41 to 50 years old, female, married, had a Certificate of Academic Requirements, had served for 16 to 20 years, and attended division-level trainings and seminars. Most learners were 10 years old and female. The study revealed that digital and technology-enhanced tools were utilized to a very great extent, while experiential and hands-on tools were used moderately. Teachers' competence in utilizing innovative tools was rated strongly agree across all areas. Learners' academic performance was evaluated as Closely Approximating Mastery in Science 4 competencies. A significant positive correlation was found between the extent of utilization of instructional tools, teachers' competence, and learners' academic performance. However, challenges such as limited resources, tight timeframes, lack of learner motivation, insufficient training, and technology limitations were noted. The study concluded that there is a significant relationship between the effective use of innovative instructional tools, teacher competence, and students' academic performance. Based on these findings, it was recommended that Garcia Elementary School implement an innovative instructional tool utilization plan for its teachers.

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KEYWORDS: *Innovative instructional competence plan, teacher competence, learners' academic performance, Science 4, correlational research, MAED, Administration and Supervision, Bohol, Philippines.*

INTRODUCTION

Teachers' pedagogical content knowledge, especially in science, is crucial to translating curriculum goals, big ideas, and science topics into meaningful learning experiences. Aydın & Turhan (2023) found that experienced science teachers vary in their competence across PCK subcomponents, with curriculum knowledge and subject matter understanding directly influencing how effectively teachers plan and sequence science topics.

The latest PISA 2022 results reveal that Filipino students' performance in science continues to fall below the OECD average, with only 23% of students reaching the baseline proficiency level. This reflects challenges in science education in the Philippines, which can be linked to teacher competence. Research suggests that improving teachers' subject knowledge, pedagogical skills, and assessment practices is crucial for enhancing student outcomes in science (OECD, 2023). These results highlight the need for

professional development and support for teachers to effectively teach science concepts and foster higher-order thinking among students.

Research by Tañedo et al. (2024) shows that teachers who are well-versed in aligning their teaching goals with the science curriculum, while considering their students' developmental stages, create a more engaging and coherent learning experience. When teachers design lessons that integrate clear instructional goals and key scientific concepts, students are more likely to develop a deeper understanding of the subject, which subsequently boosts their academic performance. This connection between instructional design and student learning outcomes underscores the importance of teacher competence in setting clear and structured learning objectives.

Moreover, effective science instruction depends on teachers' ability to design, conduct, and facilitate investigations and demonstrations. Alarcon et al. (2023) emphasize that inquiry-based learning, which includes structured hands-on investigations, enhances learners' scientific reasoning, explanation skills, and understanding of scientific practices, highlighting that teacher competency in these areas directly affects classroom implementation.

Furthermore, teachers' competence in scientific investigations and demonstrations, including how to facilitate inquiry, experiments, and science processes, is critical for students to construct knowledge actively rather than passively receive information. Studies have shown that instructional practices emphasizing inquiry and engagement correlate with higher academic achievement, as learners are more likely to internalize science concepts when teachers effectively use investigations and demonstrations to connect theory with practice. Although this relationship is mediated by learners' engagement and instructional quality, strong investigative instruction remains a key driver of performance in science (Bibon, 2022).

In addition, teacher competence in selecting and using scientific resources such as manipulatives, digital visualizations, and laboratory materials has a significant impact on academic performance, as students learn better with well-aligned instructional tools that support sense-making. For example, instructional practices that integrate these resources with clear teaching goals help learners construct scientific meaning, leading to improved performance in science assessments. Research demonstrates that teachers' skillful deployment of resources supports learner understanding and bridges the gap between curriculum demands and student achievement (Bibon, 2022).

Compelling evidence suggests that teachers' pedagogical content knowledge including science content understanding and instructional competency correlates with students' academic performance. For example, recent research by Khoboli (2025) indicates that while PCK may not directly predict student performance in all contexts, how teachers apply this knowledge through practices such as inquiry teaching and structured instruction influences student achievement outcomes in science (Khoboli et al., 2025).

Providing clear and accurate scientific explanations is a central component of instruction that directly impacts learner performance. Teachers who confidently explain complex concepts using multiple representations (diagrams, models, analogies) help students internalize key ideas more effectively. Empirical evidence suggests that when teachers possess solid pedagogical and content knowledge, especially in explaining science concepts, students show higher levels of conceptual understanding and improved academic results (Usak et al., 2022).

Ultimately, the overall competence of science teachers in applying these instructional tools and strategies is closely linked to student academic performance. The integration of content knowledge, pedagogical expertise, and effective instructional practices creates a learning environment where students can succeed. As demonstrated by Khoboli (2025), teachers who exhibit high competence in their instructional approaches foster higher academic achievement in students. With this, this research will evaluate the competence of teachers on content knowledge on teaching science instructional tools at Garcia Elementary School, Barangay Garcia, San Miguel, Bohol, for the School Year 2025-2026 as a basis for the teacher training roadmap.

Theoretical and Conceptual Framework

The study is anchored on the following theories: Constructivist Learning Theory by Jean Piaget and Lev Vygotsky, Bloom's Taxonomy by Benjamin Bloom, Experiential Learning Theory by David Kolb, and Active Learning Theory.

Constructivist Learning Theory

Constructivist Learning Theory, grounded in the works of Piaget and Vygotsky, posits that learners actively construct knowledge through interaction with their environment and through social engagement. In science education, innovative instructional tools such as simulations, virtual laboratories, and inquiry-based modules align strongly with constructivist principles by promoting active exploration and collaborative meaning-making. Recent international research confirms that constructivist-oriented science

classrooms significantly enhance conceptual understanding and scientific reasoning. For instance, Anagün (2021) found that inquiry-based and student-centered science instruction improves higher-order thinking and conceptual retention compared to traditional lecture-based approaches. Similarly, a 2023 study in Education and Information Technologies reported that digital simulations grounded in constructivist pedagogy significantly improved students' understanding of abstract scientific concepts, particularly in physics and chemistry (Liu et al., 2023).

Vygotsky's concept of the Zone of Proximal Development (ZPD) further strengthens the relevance of innovative science tools, as scaffolding through guided digital platforms and peer collaboration enhances learning progression. A 2022 study by Suprapto et al. demonstrated that scaffolded virtual laboratory experiences significantly improved students' problem-solving skills and conceptual mastery in science subjects.

In Southeast Asian contexts, including the Philippines, constructivist-based science interventions have shown positive impacts on engagement and achievement. Bernardo (2022) reported that Filipino learners exposed to collaborative and inquiry-driven science instruction demonstrated higher achievement scores and stronger motivation compared to those in conventional classrooms. These findings collectively affirm that innovative science instructional tools grounded in Constructivist Learning Theory promote deeper conceptual understanding and optimal learning outcomes.

Bloom's Taxonomy

Another theory is Bloom's Taxonomy, which provides a hierarchical framework for cognitive development, progressing from remembering and understanding to applying, analyzing, evaluating, and creating. Innovative science instructional tools are particularly effective when intentionally designed to target higher-order cognitive processes. Recent research emphasizes the importance of aligning science instruction with Bloom's revised taxonomy to enhance critical thinking and scientific literacy. A 2021 meta-analysis by Hei et al. found that active learning strategies structured around higher levels of Bloom's taxonomy significantly improved students' academic performance in STEM disciplines.

Furthermore, a 2022 study published in the International Journal of STEM Education reported that digital inquiry-based science modules designed to promote analysis and evaluation skills resulted in significantly higher achievement scores than traditional instruction (Lo & Hew, 2022). In the Philippine context, Dela Cruz and Lapinid (2023) found that science classes incorporating performance-based assessments aligned with Bloom's higher-order domains improved learners' mastery of scientific concepts and problem-solving abilities. These studies demonstrate that innovative science instructional tools achieve optimal outcomes when structured to progressively develop learners' cognitive complexity, as conceptualized by Bloom.

Experiential Learning Theory

Moreover, Kolb's Experiential Learning Theory posits that learning occurs through a cyclical process of concrete experience, reflective observation, abstract conceptualization, and active experimentation. Science education naturally lends itself to experiential approaches, especially when supported by innovative tools such as laboratory simulations, project-based learning kits, and augmented reality applications. A 2021 study by Cevikbas and Kaiser showed that experiential STEM learning environments significantly enhanced conceptual understanding and retention compared to traditional lecture-based instruction.

In addition, a 2023 quasi-experimental study in Journal of Science Education and Technology found that students who engaged in technology-enhanced experiential science activities demonstrated significantly higher achievement and engagement levels (Chiu et al., 2023). Locally, Garcia and Abad (2022) reported that experiential and project-based science interventions in Philippine secondary schools improved both academic performance and collaborative skills. These findings affirm Kolb's assertion that meaningful learning emerges through direct experience and reflection, highlighting how innovative science instructional tools facilitate optimal learning outcomes by immersing students in authentic scientific inquiry.

Active Learning Theory

Active Learning Theory emphasizes learner engagement through participation, discussion, collaboration, and problem-solving rather than passive reception of information. In science education, innovative instructional tools such as interactive simulations, gamified platforms, and collaborative experiments embody active learning principles. A landmark 2021 systematic review by Theobald et al. demonstrated that active learning significantly reduces achievement gaps and improves performance in STEM education across diverse student populations.

Moreover, a 2022 experimental study by Freeman et al. confirmed that classrooms implementing structured active learning strategies showed higher

test performance and conceptual gains compared to traditional lecture settings. In Asian and Philippine contexts, recent research indicates that technology-supported active learning environments in science classes significantly improve engagement and mastery of competencies (Santos & Prudente, 2023). These findings reinforce that innovative science instructional tools grounded in Active Learning Theory foster deeper engagement, critical thinking, and measurable academic improvement, thereby supporting optimal learning outcomes.

Cognitive Theory of Multimedia Learning

Another theory is, Mayer's Cognitive Theory of Multimedia Learning explains that learners understand content more meaningfully when they process words and pictures together rather than words alone. The theory rests on three major assumptions: learners process information through dual channels for visual and verbal input, each channel has limited capacity, and learning becomes meaningful. In teaching science, this theory strongly supports the use of innovative instructional tools such as animations, diagrams, interactive slides, and simulations because many science concepts are abstract and become easier to understand when verbal explanations are paired with accurate visual representations (Mayer, 2005).

This theory suggests that tools are most effective when they are designed to reduce unnecessary mental load and focus attention on the essential scientific idea. Thus, multimedia tools in science should not simply be attractive or technologically advanced; they should help students see relationships, processes, and patterns clearly, such as energy transfer, the water cycle, cell division, or motion. From this perspective, innovative tools become pedagogically valuable when they help learners build coherent mental models of scientific phenomena instead of overwhelming them with too much text, sound, or unrelated visuals.

Information Processing Theory

In addition, Information Processing Theory, associated with Atkinson and Shiffrin, views learning as the movement of information through memory systems, with control processes guiding storage and retrieval. Their framework highlights the importance of how information is attended to, coded, rehearsed, and transferred into long-term memory. Later analysis of the model also notes its lasting influence and its treatment of verbal and visual short-term stores, as well as coding processes that support transfer from short-term to long-term memory. In science teaching, this theory is relevant because science content often involves layered concepts, symbols, procedures, and explanations that must be organized carefully if students are to retain and use them meaningfully (C & M, 2016)

When applied to innovative instructional tools, Information Processing Theory supports the use of tools that help learners attend, rehearse, and retrieve information in manageable ways. In practice, this justifies science tools such as short instructional videos, guided simulations, digital flashcards, interactive quizzes, and retrieval-based review activities because these can segment content, reinforce key concepts, and provide repeated opportunities for recall. For science instruction, the value of these tools lies in how they help students process complex ideas step by step, connect new concepts with prior knowledge, and retain scientific understanding over time rather than encountering content only once.

Inquiry-Based Learning Theory

Moreover, Inquiry-Based Learning Theory is closely linked to Bruner's view that learning should be grounded in problem-solving and discovery rather than mere transmission of facts. Bruner emphasized the learner's act of finding out for oneself, while later scholarship identifies his 1961 work as a major starting point for inquiry-based education. In science education, the National Research Council further explains inquiry as both the abilities needed to conduct investigations and the teaching strategies through which scientific ideas are learned through investigation. This makes the theory highly relevant to innovative instructional tools, because science is best understood when students explore questions, gather evidence, test explanations, and construct conclusions.

Inquiry-based learning supports the use of virtual laboratories, simulation environments, digital microscopes, sensor-based activities, collaborative investigation guides, and data-collection platforms. However, the literature also shows that inquiry is not simply giving students tools and leaving them unguided. Reviews of inquiry-based education stress the importance of teacher support, scaffolding, and structured guidance, while work on technology-enhanced inquiry science likewise centers on how teachers support students' inquiry learning. Therefore, innovative tools in science become most effective when they are used to structure questioning, evidence gathering, interpretation, and explanation, rather than as stand-alone technologies (Dobber et al., 2017).

Curriculum Alignment Theory

Last theory anchored in this study is Curriculum Alignment Theory, is well represented by Biggs's concept of constructive alignment, which argues that intended learning outcomes, teaching and learning activities, and assessment tasks should be

systematically matched. Biggs explains that alignment requires teachers to derive objectives in terms of meaningful performances, choose activities that elicit those performances, and assess them using measures consistent with the objectives. In science teaching, this theory is highly relevant to innovative instructional tools because it provides a clear basis for deciding whether a tool genuinely supports the curriculum or merely adds novelty to the lesson (Biggs, 1996).

This theory means that innovative tools should be selected according to the competencies and evidence of learning expected in the lesson. A simulation should be used if it helps students explain a scientific process targeted in the curriculum; a virtual lab should be used if the intended outcome includes investigation skills; and an interactive quiz platform should be used if it measures the same conceptual understanding emphasized during instruction. Through this lens, innovative instructional tools are effective not because they are digital or modern, but because they are aligned with science content standards, classroom activities, and assessment expectations in a coherent instructional design.

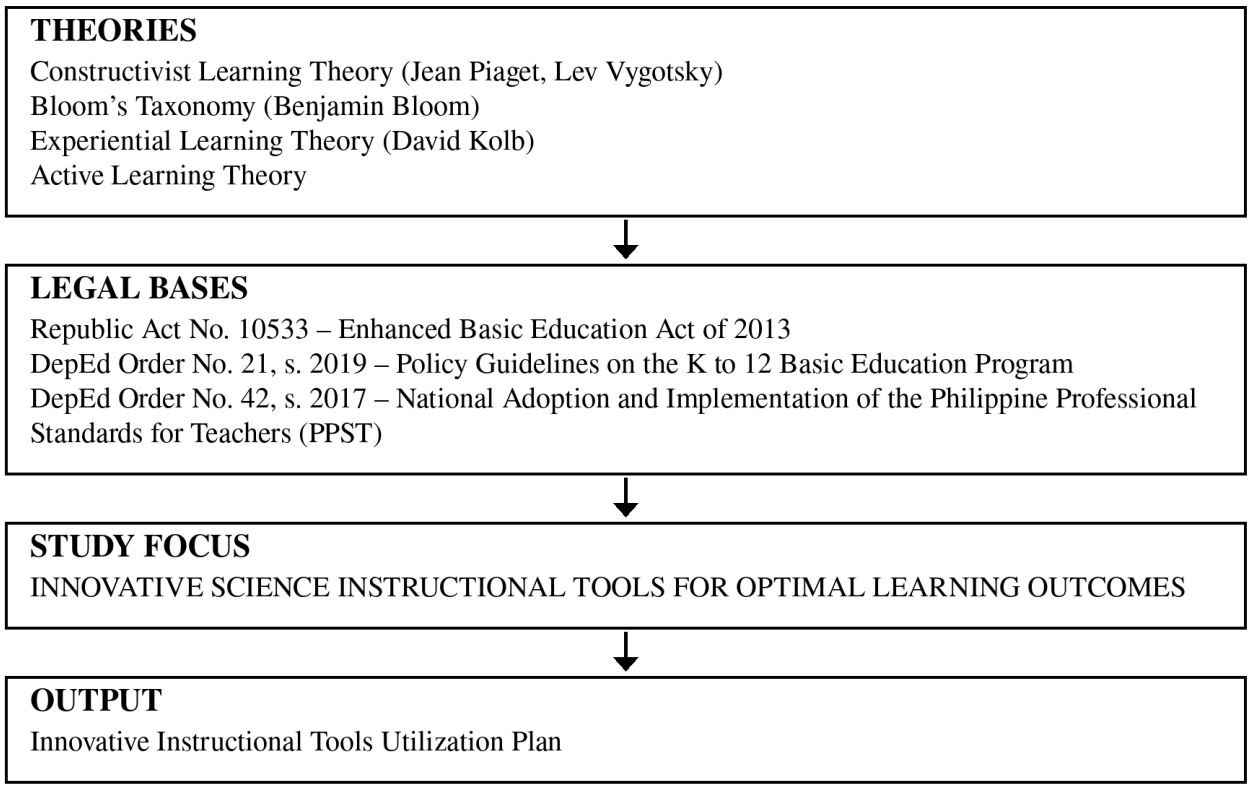


Figure 1 Theoretical Framework

Legal Bases

Along with these theories and strategies, this research also anchors the following legal basis. First is Republic Act No. 10533 (Enhanced Basic Education Act of 2013) - This law mandates the implementation of the K to 12 Basic Education Program, which aims to improve the quality of education and produce graduates who are ready for the workforce, higher education, and entrepreneurship. The law promotes the use of innovative methods, materials, and tools in instruction to enhance learning outcomes. Specifically, it calls for the integration of 21st-century skills in the curriculum, which includes the use of technology and interactive tools in science education.

Secondly, DepEd Order No. 21, s. 2019 (Policy Guidelines on the K to 12 Basic Education Program)- This order outlines the vision of DepEd for K to 12 education, where the goal is to develop the learner's competencies, values, and skills necessary for life in the 21st century. It emphasizes the importance of innovative instructional practices, such as using digital and interactive tools to improve learning outcomes.

Lastly, DepEd Order No. 42, s. 2017 - National Adoption and Implementation of the Philippine Professional Standards for Teachers (PPST) - This order provides a framework for professional development and teaching standards for Filipino educators. It emphasizes that teachers must continually update their pedagogical skills, which includes adopting innovative and technology-based teaching tools to improve student learning outcomes. This supports the idea of using modern instructional tools to enhance science teaching.

By anchoring the research on these legal bases, the study aligns with the Philippine government's educational policies that advocate for the use of innovative instructional tools to enhance student learning, particularly in science education.

THE PROBLEM

Statement of the Problem

This research evaluated the innovative instructional tools for teaching Science 4 at Garcia Elementary School, Barangay Garcia, San Miguel, Bohol, for the School Year 2025-2026 as a basis for the innovative instructional tools utilization plan.

It specifically aimed to respond the following questions:

1. What is the relevant information as to:
1.1. Teachers'
1.1.1. age and gender;
1.1.2. civil status;
1.1.3. highest educational attainment;
1.1.4. number of years in service;
1.1.5. relevant trainings and seminars, and

1.2. learners' age and gender?

2. As perceived by the respondents group, to what extent is the utilization of the innovative instructional tools for teaching Science 4 as to:
2.1. foundational;
2.2. digital and technology-enhanced;
2.3. interactive and student-centered, and
2.4. experiential and hands-on?

3. As perceived by the respondents group, what is the level of competence in utilizing innovative instructional tools in teaching science 4 in terms of:
3.1. instructional goals, big ideas, and topics;
3.2. investigations and demonstrations;
3.3. resources;
3.4. ideas;
3.5. explanations, and
3.6. models and representations?

4. What is the academic performance level of learners as to the following four competencies:
4.1. compare different types of soil;
4.2. recognize that water is one of the basic needs of plants and animals;
4.3. identify the effect of different types of soil on the growth of plants and
4.4. participate in a guided investigation?

5. Is there a significant relationship between the extent of utilizing innovative instructional tools and the level of competence in teaching science 4 and the academic performance of learners?

6. What are the issues and concerns encountered in teaching science?

7. Based on the findings, what innovative instructional tools utilization plan can be developed?

Null Hypothesis

There is no significant relationship between the extent of utilizing innovative instructional tools and the level of competence in teaching science 4 and the academic performance of learners. The provided null hypothesis will be examined at the significance level of 0.05.

Significance of the Study

This study is beneficial for the following:
Education Policy Makers. This study provides insights into the effectiveness of innovative science instructional tools, guiding policy development to enhance educational practices.

Department of Education. The findings help DepEd refine educational policies and curricula to incorporate modern teaching tools for improved student outcomes.

School/ Educational Institution. Schools can adopt the study's recommendations to integrate effective teaching tools, fostering a more engaging learning environment.

The Administrators. This study provides administrators with practical insights on integrating innovative instructional tools to support teachers, enhance learning outcomes, and drive overall school improvement.

School heads. School heads can use the study to support teachers with training and resources for implementing innovative instructional tools.

Teachers. Teachers will benefit by learning how to effectively integrate innovative instructional tools to improve student engagement and learning.

Learners. Learners will experience enhanced understanding and engagement in science through the use of innovative and interactive instructional tools

Society/Community. The study aims to improve the quality of education, producing scientifically literate individuals who contribute to societal progress

The Researcher. The study adds valuable knowledge to educational research, exploring the impact of technology on learning outcomes.

Future researchers. Future researchers can use this study as a foundation for further exploring the role of technology and innovation in education.

Methodology

Research Design

The study employed a descriptive-survey research design to gather data on the competence of teachers in content knowledge and their use of instructional tools for teaching science at Garcia Elementary School, Barangay Garcia, San Miguel, Bohol. As the research tool relies on surveys, this design was considered appropriate for the investigation. Statistical techniques, including percentage, frequency, weighted mean, standard deviation, and Pearson correlation, was utilized for data analysis. Additionally, the study aimed to determine the significant correlation between the identified variables, thereby enhancing the relevance and validity of the chosen design.

Input–Process–Output Model

The research followed a systems approach, structured around the input, process, and output framework. The input data included the teachers' profiles, such as age, civil status, gender, highest educational attainment, years of service, relevant training and seminars attended, as well as learners' age and gender.

Additionally, the input consisted of relevant information designed to gather insights on: (1) the competence of teachers in content knowledge and their use of instructional tools for teaching science, and (2) learners' academic performance.

The initial step in the study involved pre-data gathering procedures, including the identification of participating respondents. Following this, the researcher prepared the questionnaire and draft a request letter to the principal seeking approval to conduct the study. Once the letter was approved, respondents received an online questionnaire link via Google Forms.

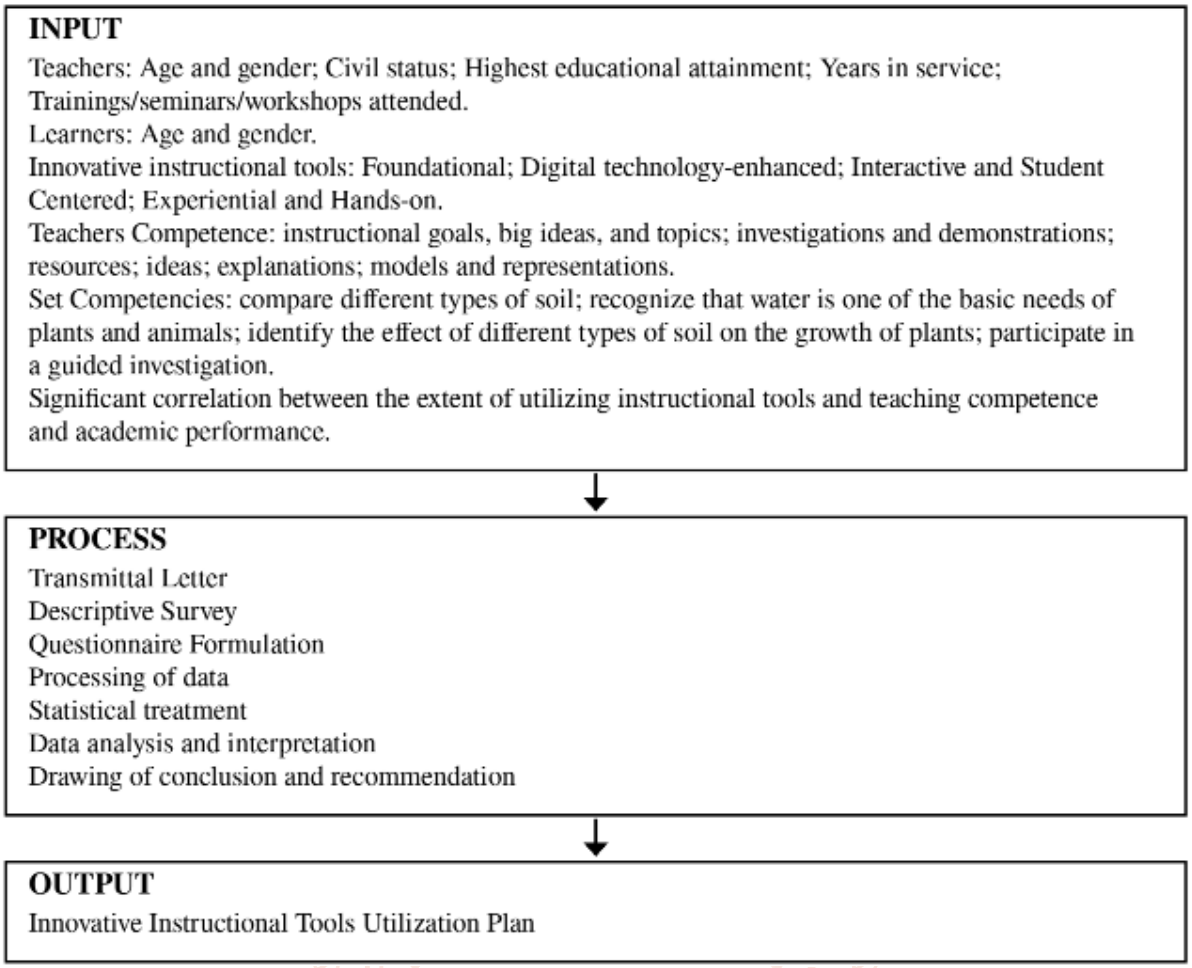


Figure 2 Flow of the Study

Data were collected via a survey questionnaire distributed to randomly selected respondents. The instrument was divided into four sections to capture relevant information. To encourage participation, the researcher ensured confidentiality by anonymizing responses and emphasizing the voluntary nature of the study.

Once data was collected, it was submitted to a statistician for statistical analysis. The findings underwent further presentation, analysis, and interpretation under the guidance of the research adviser. Based on the results, an innovative instructional competence plan.

Research Environment

This study took place at Garcia Elementary School, located in the hilly terrain of Barangay Garcia, San Miguel, Bohol, under the dedicated leadership of our Cluster Head Dr. Meshel H. Sarong, EdD. The school's location, surrounded by nature and elevated landscapes, offers a peaceful yet challenging setting for both teaching and learning.

Garcia Elementary School serves children from Kindergarten to Grade 6, with a small but committed team of five teachers, including the School-In-Charge (SIC). Despite limited resources and the rural setting, the school community remains resilient and passionate about delivering quality education. Teachers work closely together to meet the diverse needs of their learners, many of whom come from modest backgrounds and walk long distances just to attend class.

This research focused on Grade Four learners in Science, a critical stage where students begin to explore scientific concepts more deeply and develop their reasoning skills. The Grade Four class consists of 30 enthusiastic learners, each with unique strengths and learning styles. Their curiosity and energy make them ideal participants for this study, which aims to understand how teaching strategies and classroom conditions affect their performance and comprehension in Science.

Garcia Elementary School may be small, but it is a place of big dreams and strong community spirit. The insights gained from this study will not only benefit the Grade Four learners but also contribute to improving science instruction across similar rural schools.

Respondents

The respondents of the study were the 10 teachers and 30 grade 4 learners of Garcia Elementary School, Barangay Garcia, San Miguel, Bohol.

Table 1 Distribution of Respondents

Respondent Groups	Frequency	Percentage
Teachers	10	25
Learners	30	75
Total	40	100

Table 1 presents the distribution of respondents in the study, categorizing them into two groups: teachers and learners. Out of the total 40 respondents, 10 are teachers, accounting for 25% of the sample, while 30 are learners, making up 75% of the respondents. This distribution highlights the emphasis on learner perspectives, as the majority of the participants are students, with a smaller proportion representing the teachers. The table provides a clear breakdown of the respondent groups and their respective contributions to the study, ensuring a comprehensive understanding of the views and experiences of both teachers and learners.

Research Instrument

The instrument was divided into three parts: a profile of the respondents, a survey form on the extent of utilization of the innovative instructional tools, level of competence in teaching science 4, and academic performance of the learners.

The first part of the questionnaire had the demographic profile of the teachers' which included their age, sex, highest educational attainment, number of years in service and number of relevant trainings/ seminars/workshops attended and learners' age, gender and reading levels.

The second component of the questionnaire focused on the level of competence on content knowledge of teaching science instructional tools, which is taken from the study of Mikeska et al. (2018), entitled Assessing Elementary Teachers' content Knowledge for Teaching Science for the ETS® Educator Series: Pilot results. On the other hand, the third component, which are the science competencies are based on the Matatag English Curriculum Guide.

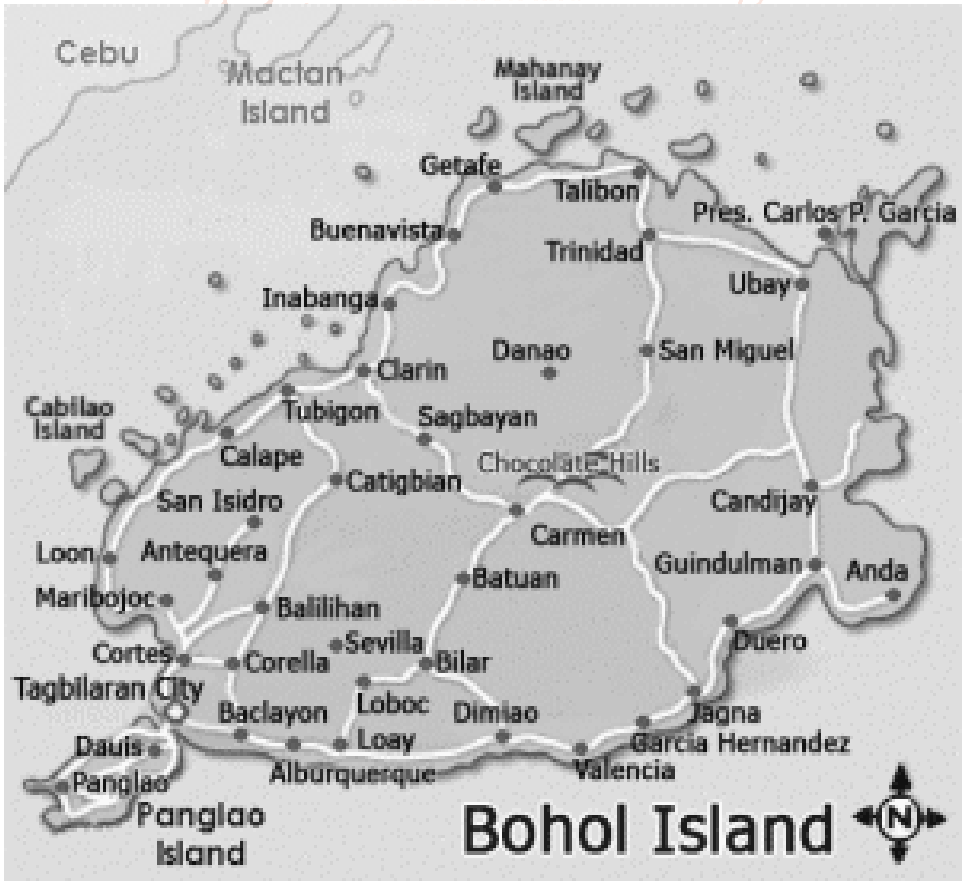


Figure 3 Location of the Research Environment



Figure 4 Garcia Elementary School

Data Gathering Procedure

First, an approval letter was sent to the principal of Garcia Elementary School, requesting permission to conduct the study. Once the letter is approved, a link to the questionnaire was distributed to the respondents. They were allotted sufficient time, preferably 20 to 30 minutes, to complete the questionnaire. The collected data was forwarded to a statistician for statistical analysis. Subsequently, the data underwent further presentation, analysis, and interpretation under the guidance of the research adviser. Finally, a draft of the study was submitted for final review, revisions, and approval.

Ethical Considerations

To encourage participation, the researcher ensured confidentiality by anonymizing responses and emphasizing the voluntary nature of the study.

Statistical Treatment of Data

Simple Percentage Analysis. Comparing two or more arrangements of information is utilized to decide the relationship between the relationship of the given data.

Weighted Mean. This is an average where each observation's relative relevance is determined by assigning weights to its individual values. It is the total of the calculated values obtained by multiplying the number of replies by the set weights.

Pearson-r. This was used to determine the significant relationship between the on-content knowledge of teaching science instructional tools and learners' academic performance.

Standard Deviation. This statistical tool was used to analyze the variability in a set of data values. It helps determine how to spread out the data points from the mean, indicating the consistency or variability in the dataset.

Scoring Procedure

The following was the scoring procedures for the level of competence on content knowledge of teaching science instructional tools.

Table 2 Scoring Procedure for Competence in Using Science Instructional Tools

Weight	Scale	Category	Verbal Description
5	4.20- 5.00	Strongly Agree	The teacher demonstrates exceptional competence and consistently integrates science instructional tools effectively to enhance student learning outcomes.
4	3.40- 4.19	Agree	The teacher demonstrates good competence and effectively uses science instructional tools in most teaching situations.
3	2.60- 3.39	Neutral	The teacher demonstrates moderate competence in using science instructional tools, with room for improvement in integration and application
2	1.80- 2.59	Disagree	The teacher shows limited competence in using science instructional tools and struggles to integrate them effectively in lessons.
1	1.00-1.79	Strongly Disagree	The teacher lacks competence in using science instructional tools and rarely incorporates them into teaching practices.

Operational Definitions

Academic performance level: The measurement of a student's achievement and proficiency in academic tasks, typically assessed through grades, tests, and evaluations.

Content knowledge of teaching science instructional tools: The depth of understanding that teachers possess regarding the tools, methods, and resources used to effectively teach science concepts.

Scientific instructional goals, big ideas, and topics: The overarching aims and central themes that guide the teaching of science, focusing on key concepts and areas of inquiry.

Scientific investigations and demonstrations: The process of conducting experiments and showing practical applications of scientific concepts to enhance student understanding.

Scientific resources: The materials, texts, journals, and media used in teaching science, providing students with the information and tools needed for learning.

Student ideas: The thoughts, questions, and concepts that students bring to the classroom, which can influence the learning process and be used to guide instruction.

Scientific explanations: Clear, evidence-based reasoning that helps describe and interpret scientific phenomena, promoting deeper understanding.

Scientific models and representations: Visual, mathematical, or conceptual tools that represent scientific concepts, aiding in the simplification and communication of complex ideas.

Innovative Instructional Tools Utilization Plan: A structured plan outlining the courses,workshops, and experiences designed to enhance a teacher's skills and professional development over time.

Learning competency: The specific skills and knowledge that students are expected to acquire in a subject area, demonstrating their readiness to apply what they have learned.

Teachers' competence: The level of knowledge, skills, and abilities a teacher possesses in effectively delivering instruction and supporting student learning.

Results and Discussion

Teacher Profile

Age Profile of the Teachers

Table 3 Age Profile of the Teachers

Variable	Teachers: F	Teachers: Percentage
51-60 years old	3	30
41-50 years old	4	40
31-40 years old	1	10
21-30 years old	2	20
Total	10	100
Mean	43.5	43.5
SD	10.77	10.77

The data presented in Table 3 illustrates the age distribution of the participating teachers. Among the ten respondents, the majority fall within the 41–50 years age bracket (40%), followed by those aged 51–60 years (30%). Younger teachers, specifically those in the 21–30 years and 31–40 years brackets, comprise 20% and 10% of the sample, respectively. The computed mean age of the teachers is 43.5 years, with a standard deviation of 10.77 years, indicating a moderate variation in age across the sample.

This profile suggests a workforce dominated by seasoned educators who are likely to have substantial professional experience. A large cross-sectional study found that age per se was positively associated with certain instructional and social-emotional competencies, such as resilience and engagement management, beyond the effects of years of experience alone (Scheirlinckx et al., 2025). These findings suggest that teachers in older age brackets may possess strengths in specific dimensions of teaching practice that contribute to classroom dynamics in ways that complement, but do not entirely overlap with, experience gained over time

Gender Profile of the Teachers

Table 4 Gender Profile of the Teachers

Variable	Frequency	Percentage
Male	1	10
Female	9	90
Total	10	100

The gender profile of the teacher respondents indicates a stark imbalance: 90% of the sample are female teachers, while only 10% are male. This distribution reflects a heavily feminized teaching workforce within the context of the study's setting. Such a disparity suggests that women dominate the teaching profession among the sampled teachers, a pattern consistent with longstanding global trends in basic and early education sectors where female practitioners represent the majority of instructional staff.

The observed predominance of female teachers aligns with broader educational workforce data. International data show that women comprise about 70% of teachers across all levels of education on average among OECD countries, with especially high concentrations at the primary and pre-primary levels and decreasing representation at higher levels of education (Organisation for Economic Co-operation and Development [OECD], 2021). This female predominance is attributed in part to societal norms that associate caregiving and nurturing roles with women, which historically influence occupational choice and reinforce gender segregation in the profession.

Civil Status of the Teachers

Table 5 Civil Status of the Teachers

Variable	Frequency	Percentage
Single	4	40
Married	6	60
Total	10	100

Table 5 shows the civil status of the teacher respondents. The civil status distribution of the teachers reveals that 60% are married and 40% are single. This indicates that a majority of the sampled teachers are in marital relationships.

Empirical research on teacher demographics supports the observation that a high proportion of teachers tend to be married. For instance, a socio-demographic study of public school teachers found that a significant majority (76.12%) were married, with married teachers often displaying distinct work attitudes and responsibilities compared to their single counterparts (e.g., greater timeliness and collaboration) (Scheirlinckx et al., 2024). Such findings imply that marital status may influence professional engagement, time management, and behavioral competence in educational settings, underscoring the relevance of civil status as a demographic factor when analyzing teacher profiles and related professional outcomes

Highest Educational Attainment of the Teachers

Table 6 Highest Educational Attainment of the Teachers

Variable	Frequency	Percentage
Full–fledged doctor's degree in education	1	10
Full–fledged master's degree in education	3	30
With Certificate of Academic Requirements of Education	4	40
With 15 units in master's degree of Education	2	20
Total	10	100

The distribution of the highest educational attainment of the teachers shows that 40% hold a Certificate of Academic Requirements in Education, making it the most common qualification among the sample. This is followed by 30% of teachers who have a full-fledged master's degree in education. Teachers with 15 units in a master's degree constitute 20% of the sample, while only 10% have attained a full-fledged doctor's degree in education. The table illustrates a range of educational levels, from those still completing graduate coursework to those who have achieved the highest academic credential in the field.

The research conducted by Abun et al. (2021) reveals that increased educational attainment correlates with elevated self-efficacy, suggesting individuals are more capable of executing tasks, confronting challenges, and achieving their objectives. For instructors, this is a very useful quality.

Number of Years in Service of the Teachers

Table 7 Number of Years in Service of the Teachers

Variable	Frequency	Percentage
16 – 20 yrs.	4	40
11 – 15 yrs.	1	10
6 – 10 yrs.	2	20
1-5 yrs.	3	30
Total	10	100
Mean	11	11
SD	6.40	6.40

Table 7 presents the data on the number of years in service of the teacher respondents. The distribution of years in service among the teacher respondents indicates that the largest proportion of teachers (40%) have served between 16 and 20 years. Teachers with 1–5 years of experience comprise 30% of the sample, while those with 6–10 years account for 20%. Only 10% of the sample have 11–15 years of service. The mean length of service is 11 years, with a standard deviation of 6.40, indicating a moderate spread of experience levels among the teachers. This profile reveals a mixture of early-career and veteran educators, with a notable concentration in the later stages of professional tenure.

A study by Zulkarnain, Fitria, and Puspita (2021) found in their investigation of state senior high school teachers that teaching experience had a statistically significant effect on teacher performance, indicating that greater experience was associated with improved performance outcomes, likely because experienced teachers become more familiar with classroom routines, problem-solving, and instructional demands over time

Trainings, Seminars, and Workshops Attended

Table 8 Trainings, Seminars, and Workshops Attended

Variable	Frequency	Percentage
National	3	30
Regional	2	20
Division	4	40
School	1	10
Total	10	100

The distribution of trainings, seminars, and workshops attended by the teachers indicates that the majority of professional development activities occurred at the division level (40%). National-level participation follows at 30%, while regional-level engagements account for 20%. Only 10% of teachers attended school-based training. This pattern suggests that division and national-level professional development opportunities constitute the primary sources of formal capacity building for the teachers.

Research supports the positive role of professional development experiences in enhancing teacher effectiveness. In a 2021 study, Akiba and Liang found that higher quality and more frequent training programs are significantly associated with improved teacher instructional practices and professional growth. Their analysis highlights that structured professional learning opportunities, especially those that are contextually relevant and sustained, strengthen teachers' pedagogical skills and contribute to ongoing reflective practice. The predominance of division-level and national-level training in this sample may indicate access to more structured learning platforms, which could facilitate continuous professional improvement among teachers.

Learner Profile

Age Profile of the Learners

Table 9 Age Profile of the Learners

Variable	Frequency	Percentage
9 years old	8	27
10 years old	19	63
11 years old	3	10
Total	30	100

The age profile of the learners shows that the majority are 10 years old, comprising 63% (n = 19) of the sample. The next largest group is 9-year-olds at 27% (n = 8), while only 10% (n = 3) are 11 years old. Across the 30 learners, this distribution suggests a concentration in the middle of the age range, with most students clustered at age 10.

Research by Darling-Hammond et al. (2021) emphasizes that technology-integrated pedagogy can improve engagement, conceptual understanding, and skill development when aligned with students' developmental levels. Teachers of the present study can leverage innovative tools to provide differentiated instruction, reinforce scientific concepts, and encourage active participation, particularly for learners around the 10-year-old mark who are generally receptive to hands-on and interactive learning experiences. Thus, the learners' age profile directly informs the selection and application of instructional innovations that optimize learning outcomes.

Gender Profile of the Learners

Table 10 Gender Profile of the Learners

Variable	Frequency	Percentage
Male	12	40
Female	18	60
Total	30	100

The gender profile of the learners shows that females constitute the majority at 60% (n = 18), while males make up 40% (n = 12). This distribution suggests a moderate gender imbalance within the classroom, with slightly more female learners than male. Research indicates that integrating technology-based or interactive learning tools—such as gamified apps, simulations, and collaborative digital platforms—can enhance engagement for both genders, though learning preferences may vary (Li & Ranieri, 2021).

Utilization of Instructional Tools for Teaching Science 4

Foundational Tools

Table 11 Foundational Tools

Indicators	WM	SD	Interpretation
1. Chalkboard/ white board	3.20	0.295	Moderate Extent
2. Manila Paper and cartolina charts	2.50	0.379	Low Extent
3. Printed pictures and flashcards	4.70	0.359	Very Great Extent
4. Graphic organizers (Venn diagrams, concept maps)	3.90	0.281	Great Extent
5. Posters and anchor charts	3.70	0.277	Great Extent
6. Modules, Worksheets and Handouts	4.70	0.359	Great Extent
7. Realia	4.50	0.333	Very Great Extent
8. Models (e.g., globe, human heart model)	4.20	0.301	Great Extent
9. Laboratory Experimentations	3.30	0.288	Moderate Extent
Average Mean	3.86	0.319	Great Extent

4.21- 5.00 Very great extent 2.61-3.40 Moderate extent 1.00-1.80 Very low extent
3.41- 4.20 Great extent 1.81-2.60 Low extent

The data presented in Table 11 highlights the use of various foundational tools by teachers, measured by the weighted mean (WM) and standard deviation (SD). Tools such as printed pictures and flashcards (WM = 4.70, SD = 0.359) and modules, worksheets, and handouts (WM = 4.70, SD = 0.359) were used to a very great extent, emphasizing the importance of visual and printed materials in enhancing student learning. Realia (WM = 4.50, SD = 0.333) also showed strong utilization, suggesting that teachers value hands-on, real-world objects for making concepts more tangible. In contrast, chalkboard/whiteboard (WM = 3.20, SD = 0.295) and laboratory experimentations (WM = 3.30, SD = 0.288) were used moderately, reflecting their continued relevance but with less frequency. The findings suggest that teachers favor tools that facilitate interactive and visual learning, such as graphic organizers (WM = 3.90, SD = 0.281) and posters/anchor charts (WM = 3.70, SD = 0.277), which enhance the organization and clarity of lessons.

Foundational tools in science are important because many science ideas are abstract, microscopic, or not directly observable, so students need clear representations to connect new concepts with prior knowledge. Cook (2011) explained that visual representations play an important role in communicating science concepts and supporting retention, while the National Research Council (2012) emphasized that science instruction should be organized around core ideas, practices, and crosscutting concepts.

Digital and Technology-Enhanced Instructional Tools

Table 12 Digital and Technology-Enhanced Instructional Tools

Indicators	WM	SD	Interpretation
1. Power point/ Google Slides	5.00	0.405	Very Great Extent
2. Interactive whiteboards	3.90	0.281	Great Extent
3. 3. Video clips (e.g., from YouTube)	4.90	0.389	Very Great Extent
4. Educational simulations (e.g., PhET Interactive Simulations)	4.10	0.293	Great Extent
5. Google classroom, Padlet and Moodle	3.80	0.278	Great Extent
6. Kahoot, Quizizz, Mentiter and etc.	3.60	0.277	Great Extent
Average Mean	4.22	0.321	Very Great Extent

Table 12 presents the use of digital and technology-enhanced instructional tools by teachers, evaluated based on their weighted mean (WM) and standard deviation (SD). Tools such as PowerPoint/Google Slides (WM = 5.00, SD = 0.405) and video clips (WM = 4.90, SD = 0.389) were utilized to a very great extent, highlighting the effectiveness of multimedia in engaging students and enhancing lesson delivery. Interactive whiteboards (WM = 3.90, SD = 0.281) and educational simulations (WM = 4.10, SD = 0.293) also emerged as popular tools, suggesting that teachers are leveraging technology to make learning more interactive and immersive. Platforms like Google Classroom, Padlet, and Moodle (WM = 3.80, SD = 0.278), along with gamified tools such as Kahoot, Quizizz, and Mentimeter (WM = 3.60, SD = 0.277), were used to a great extent, emphasizing the role of digital platforms and interactive learning activities in facilitating student participation and engagement.

Digital and technology-enhanced tools are useful because they can make difficult or dangerous scientific phenomena easier to visualize and explore, while also allowing students to repeat activities, manipulate variables, and receive immediate feedback. In a meta-analysis of 92 studies, Hillmayr et al. (2020) found that digital tool use had a positive effect on mathematics and science learning outcomes, and that teacher training in using these tools significantly influenced their effectiveness.

Interactive and Student-Centered Instructional Tools

Table 13 Interactive and Student-Centered Instructional Tools

Indicators	WM	SD	Interpretation
1. Board games aligned with lesson objectives	4.20	0.301	Great Extent
2. Digital Escape Rooms	3.40	0.283	Moderate Extent
3. Simulations games	4.20	0.301	Great Extent
4. Case study materials	3.60	0.277	Great Extent
5. Problem scenario/ Investigation Kits	3.50	0.279	Great Extent
6. Think-pair-share guides	4.50	0.333	Very Great Extent
7. Jigsaw activity sheets	4.20	0.301	Great Extent
Average Mean	3.94	0.296	Great Extent

The data in Table 13 show that interactive and student-centered instructional tools are generally used to a high degree, with an overall mean of 3.94 interpreted as “Great Extent.” Among the indicators, think-pair-share

guides obtained the highest mean of 4.50, indicating a "Very Great Extent" of use. This suggests that collaborative strategies are commonly applied in classroom instruction. Other tools such as board games aligned with lesson objectives, simulation games, and jigsaw activity sheets also received high ratings (WM = 4.20), reflecting consistent use of interactive and cooperative learning activities. The low standard deviations indicate that respondents have similar perceptions regarding the extent of use of these tools.

Meanwhile, digital escape rooms obtained the lowest mean of 3.40, interpreted as "Moderate Extent," indicating that they are less frequently used compared to other strategies. Case study materials and problem scenario or investigation kits, while still interpreted as "Great Extent," have slightly lower mean scores (3.60 and 3.50). Overall, the results indicate that most interactive and student-centered tools are commonly utilized, although some strategies are used less frequently than others.

Interactive and student-centered tools shift science instruction away from passive listening and toward active meaning-making, where students learn by engaging with evidence, testing ideas, and participating in scientific reasoning. Furtak et al. (2012) found that inquiry-based science teaching improves student learning, especially when instruction includes meaningful cognitive engagement and appropriate guidance, while Freeman et al. (2014) reported that active learning improves student performance and lowers failure rates across STEM courses.

Experiential and Hands-On Innovative Tools

Table 14 Experiential and Hands-On Innovative Tools

Indicators	WM	SD	Interpretation
1. Robotics kits	2.60	0.364	Low Extent
2. Coding platforms	2.90	0.325	Moderate Extent
3. Digital storytelling tools	4.50	0.333	Very Great Extent
4. Infographic creators (e.g. Canva)	3.70	0.277	Great Extent
5. Video editing apps	3.10	0.304	Moderate Extent
Average Mean	3.36	0.320	Moderate Extent

The data on experiential and hands-on innovative tools show a moderate level of utilization, as indicated by the overall mean of 3.36. Among the indicators, digital storytelling tools obtained the highest weighted mean of 4.50, interpreted as "Very Great Extent," suggesting that learners are highly engaged in activities that allow creativity and personal expression through narratives. Infographic creators (e.g., Canva) also received a relatively high mean of 3.70, indicating a "Great Extent" of use, which reflects the integration of visual-based outputs in learning tasks. The low standard deviations across indicators imply that respondents have consistent views regarding the extent of use of these tools.

On the other hand, robotics kits recorded the lowest mean of 2.60, interpreted as "Low Extent," indicating limited use in classroom instruction. Coding platforms and video editing apps both fall under "Moderate Extent," with means of 2.90 and 3.10, respectively, showing that these tools are used occasionally but not as frequently as others. Overall, the findings suggest that while creative and visual tools are commonly utilized, more technical and equipment-based tools are less frequently implemented.

Experiential and hands-on tools are essential in science because they connect theory to observation, develop process skills, and give students opportunities to gather evidence, test predictions, and interpret results. Hofstein and Lunetta (2004) emphasized that laboratory work holds a central place in science education and can support inquiry, conceptual understanding, and a better appreciation of how science operates when activities are carefully designed.

Summary of Instructional Tools for Teaching Science 4

Table 15 Summary of Instructional Tools for Teaching Science 4

Indicators	WM	SD	Interpretation
1. Foundational	3.86	0.319	Great Extent
2. Digital and Technology-Enhanced	4.22	0.321	Very Great Extent
3. Interactive and Student-Centered	3.94	0.296	Great Extent
4. Experiential and Hands-on	3.36	0.320	Moderate Extent
Average Mean	3.84	0.314	Great Extent

The data in Table 15 present a summary of instructional tools used in teaching Science 4, showing an overall mean of 3.84, interpreted as "Great Extent." Among the categories, digital and technology-enhanced tools obtained the highest mean of 4.22, indicating a "Very Great Extent" of utilization. This suggests that technology-supported strategies are widely incorporated in instruction. Foundational tools (WM = 3.86) and interactive and student-centered approaches (WM = 3.94) are also used to a "Great Extent," reflecting consistent application of both traditional and engaging teaching methods. The relatively low standard deviations indicate that respondents have similar perceptions regarding the extent of use across these categories.

In contrast, experiential and hands-on tools received the lowest mean of 3.36, interpreted as "Moderate Extent," indicating that these are less frequently used compared to the other instructional tools. Despite this, the overall findings show that teachers employ a variety of instructional approaches, with stronger emphasis on digital, foundational, and interactive methods, while experiential strategies are used to a lesser degree.

Competence in Utilizing Innovative Instructional Tools

Instructional Goals, Big Ideas, and Topics

Table 16 Instructional Goals, Big Ideas, and Topics

Indicators	WM	SD	Interpretation
1. Selecting or sequencing age-appropriate, grade-level instructional goals or big ideas for a topic.	4.70	0.359	Strongly Agree
2. Identifying the big idea(s) or instructional goal(s) of an instructional activity.	4.50	0.333	Strongly Agree
3. Choosing which science ideas or instructional activities are most closely related to a particular instructional goal.	4.70	0.359	Strongly Agree
4. Linking science ideas to one another and to particular activities, models, and representations within and across lessons.	4.70	0.359	Strongly Agree
Average Mean	4.65	0.353	Strongly Agree

The data in Table 16 indicate a very high level of agreement among respondents regarding instructional goals, big ideas, and topics, as shown by the overall mean of 4.65, interpreted as "Strongly Agree." All indicators received consistently high ratings, with three items obtaining the highest weighted mean of 4.70. These include selecting or sequencing age-appropriate instructional goals, choosing science ideas aligned with specific goals, and linking science ideas across lessons and activities. This reflects that respondents strongly recognize the importance of clear alignment and coherence in planning science instruction. The relatively low standard deviations further suggest that there is strong consistency in their responses.

Additionally, identifying the big ideas or instructional goals of an activity also received a high mean of 4.50, maintaining the "Strongly Agree" interpretation. This shows that respondents clearly understand the role of defining central concepts and objectives in guiding instruction. Overall, the findings suggest that there is a strong emphasis on organizing instruction around well-defined goals and interconnected ideas, with all indicators demonstrating a uniformly high level of agreement.

A teacher's ability to identify overarching concepts and break them down into specific, achievable learning outcomes helps students build connections between various scientific principles. This competence enables teachers to design lessons that not only meet educational standards but also foster students' deeper understanding and critical thinking. As emphasized by Anderson and Krathwohl (2001), clear instructional goals aligned with big ideas help students gain a comprehensive understanding of science concepts, leading to more effective learning outcomes.

Investigations and Demonstrations

Table 17 Investigations and Demonstrations

Indicators	WM	SD	Interpretation
1. Selecting investigations or demonstrations that facilitate understanding of disciplinary core ideas, scientific practices, or crosscutting concepts.	4.70	0.359	Strongly Agree
2. Evaluating investigation questions for quality (e.g., testable, empirical)	4.10	0.293	Agree
3. Determining the variables, techniques, or tools that are appropriate for use by students to address a specific investigation question.	4.50	0.333	Strongly Agree
4. Critiquing scientific procedures, data, observations, or results for their quality, accuracy, or appropriateness.	4.20	0.301	Agree

5. Evaluating and selecting media for engaging students in virtual investigations not possible in firsthand situations.	4.50	0.333	Strongly Agree
6. Supporting students in generating questions for investigation or identifying patterns in data and observations	4.50	0.333	Strongly Agree
Average Mean	4.42	0.325	Strongly Agree

The data in Table 17 show that respondents demonstrate a high level of agreement in terms of investigations and demonstrations, with an overall mean of 4.42 interpreted as "Strongly Agree." Several indicators received very high ratings, including selecting appropriate investigations or demonstrations (WM = 4.70), determining suitable variables and tools (WM = 4.50), evaluating media for virtual investigations (WM = 4.50), and supporting students in generating questions and identifying patterns (WM = 4.50). These results indicate that respondents consistently value the role of well-designed investigations and guided inquiry in enhancing students' understanding of scientific concepts. The low standard deviations further suggest that responses are relatively consistent across participants.

On the other hand, evaluating investigation questions (WM = 4.10) and critiquing scientific procedures, data, and results (WM = 4.20) are interpreted as "Agree," which, while still positive, are slightly lower compared to the other indicators. This suggests that these aspects are practiced but may not be as strongly emphasized as selecting and implementing investigations. Overall, the findings indicate that respondents strongly support the use of investigations and demonstrations in science teaching, particularly in facilitating inquiry and engagement, while some evaluative aspects are practiced to a slightly lesser degree.

Teachers' competence in conducting investigations and demonstrations is crucial in making science learning tangible and interactive. According to Bell et al. (2005), well-executed investigations and demonstrations not only engage students but also contribute to their long-term retention of scientific knowledge by encouraging active participation and critical thinking.

Resources

Table 18 Resources

Indicators	WM	SD	Interpretation
1. Evaluating instructional materials and other resources for their ability to sufficiently address scientific concepts.	4.70	0.359	Strongly Agree
2. Choosing resources that support the selection of accurate, valid, and age-appropriate goals for science learning.	4.70	0.359	Strongly Agree
3. The resource presents scientifically accurate information, and the sources are credible (e.g., peer-reviewed journals, reputable publishers).	4.30	0.310	Strongly Agree
4. The resource is clear, easy to understand, and accessible to both teachers and students, regardless of their level of prior knowledge.	4.50	0.333	Strongly Agree
5. The resource reflects the most current scientific findings, theories, and developments in the subject area.	4.30	0.310	Strongly Agree
Average Mean	4.50	0.334	Strongly Agree

The data in Table 18 indicate a very high level of agreement among respondents regarding the use and evaluation of resources in science instruction, as reflected by the overall mean of 4.50, interpreted as "Strongly Agree." The highest ratings were observed in evaluating instructional materials and choosing resources that support accurate and age-appropriate learning goals (both WM = 4.70). This shows that respondents place strong importance on aligning resources with instructional objectives and ensuring their relevance to learners. Additionally, the clarity and accessibility of resources (WM = 4.50) further highlight the emphasis on making materials understandable and usable for both teachers and students. The low standard deviations suggest consistency in the respondents' perceptions.

Moreover, indicators related to the credibility and accuracy of information, as well as the use of up-to-date scientific content (both WM = 4.30), also received "Strongly Agree" ratings. This indicates that respondents recognize the importance of using reliable and current resources in science teaching. Overall, the findings show that careful selection, evaluation, and use of quality resources are strongly practiced, with all indicators reflecting a consistently high level of agreement.

Effective science teachers utilize a variety of resources to enhance instruction and create engaging, multimodal learning environments. This competence is vital as it ensures students have access to materials that support their learning, whether through hands-on activities, digital simulations, or collaborative projects. According to Duran and Duran (2004), using appropriate resources ensures that learning experiences are aligned with students' needs and the curriculum goals, fostering a more engaging and effective science education environment.

Ideas

Table 19 Ideas

Indicators	WM	SD	Interpretation
1. Analyzing student ideas for common misconceptions regarding intended scientific learning.	4.50	0.333	Strongly Agree
2. Selecting diagnostic items and eliciting student thinking about scientific ideas and practices to identify common student misconceptions and the basis for those misconceptions.	4.30	0.310	Strongly Agree
3. Implementing schools continually act on and improve identified weak points of the program.	4.50	0.333	Strongly Agree
4. Developing or selecting instructional moves, approaches, or representations that provide evidence about common student misconceptions and help students move toward a better understanding of the idea, concept, or practice	4.50	0.333	Strongly Agree
5. Identifying the connections between students' talk and work and scientists' talk and work	4.50	0.333	Strongly Agree
Average Mean	4.46	0.328	Strongly Agree

The data in Table 19 show a very high level of agreement among respondents regarding ideas related to student understanding and misconceptions in science learning, as reflected by the overall mean of 4.46, interpreted as "Strongly Agree." Most indicators obtained a weighted mean of 4.50, including analyzing student misconceptions, improving weak points in the program, developing instructional approaches to address misconceptions, and identifying connections between students' and scientists' work. These results indicate that respondents strongly recognize the importance of understanding students' thinking and using it as a basis for improving instruction. The low standard deviations also suggest that there is consistency in the responses.

Meanwhile, selecting diagnostic items and eliciting student thinking obtained a slightly lower mean of 4.30, though still interpreted as "Strongly Agree." This indicates that while this practice is also highly recognized, it is slightly less emphasized compared to the other indicators. Overall, the findings suggest that respondents consistently value identifying and addressing student misconceptions, as well as aligning student understanding with scientific practices, with all indicators reflecting a strong level of agreement.

Teachers' competence in generating and implementing innovative ideas is essential in creating dynamic, stimulating lessons that inspire student curiosity and engagement in science. According to Darling-Hammond et al. (2009), teachers who introduce creative and novel teaching methods foster a growth mindset in students, leading to more meaningful learning experiences.

Explanations

Table 20 Explanations

Indicators	WM	SD	Interpretation
1. Selecting scientific language that is precise, accurate, grade appropriate, and illustrates key scientific concepts	4.50	0.333	Strongly Agree
2. Anticipating scientific language and vocabulary that may be difficult for students	4.50	0.333	Strongly Agree
3. Supporting and critiquing students' participation in and use of verbal and written scientific discourse and argumentation	4.30	0.310	Strongly Agree
4. Modeling the use of appropriate verbal and written scientific language in critiquing arguments or explanations, in describing observations, in using evidence to support a claim, etc.	4.50	0.333	Strongly Agree
Average Mean	4.45	0.327	Strongly Agree

The data in Table 20 indicate a very high level of agreement among respondents regarding explanations in science instruction, as shown by the overall mean of 4.45, interpreted as "Strongly Agree." Most indicators received a weighted mean of 4.50, including selecting precise and appropriate scientific language, anticipating difficult vocabulary, and modeling proper use of scientific language in various contexts. These findings suggest that respondents strongly emphasize clarity, accuracy, and appropriateness of language in teaching science concepts. The low standard deviations further indicate consistency in the respondents' perceptions.

Meanwhile, supporting and critiquing students' participation in scientific discourse and argumentation obtained a slightly lower mean of 4.30, although still interpreted as "Strongly Agree." This shows that while this aspect is also highly valued, it is somewhat less emphasized compared to the other indicators. Overall, the results reflect that respondents consistently recognize the importance of clear and accurate explanations, as well as the effective use of scientific language, with all indicators demonstrating a strong level of agreement.

Clear and effective explanations of scientific concepts are at the core of competent science teaching. As Hattie (2009) emphasized, effective explanations promote deep learning by making content accessible and by helping students connect new information to prior knowledge. When teachers articulate ideas clearly, they support students' ability to grasp difficult concepts and retain information.

Models and Representations

Table 21 Models and Representations

Indicators	WM	SD	Interpretation
1. Evaluating or selecting scientific models and representations that predict or explain scientific phenomena or address instructional goals	4.50	0.333	Strongly Agree
2. Engaging students in using, modifying, creating, and critiquing scientific models and representations that are matched to an instructional goal	4.70	0.359	Strongly Agree
3. Evaluating student models or representations for evidence of scientific understanding	4.30	0.310	Strongly Agree
4. Generating or selecting diagnostic questions to evaluate student understanding of specific models or representations	4.30	0.310	Strongly Agree
5. Evaluating student ideas about what makes for good scientific models and representations	4.70	0.359	Strongly Agree
Average Mean	4.50	0.334	Strongly Agree

The data in Table 21 indicate a very high level of agreement among respondents regarding the use of models and representations in science instruction, with an overall mean of 4.50, interpreted as "Strongly Agree." The highest-rated indicators, engaging students in creating and critiquing models (WM = 4.70) and evaluating student ideas about good scientific models (WM = 4.70), highlight the emphasis on active student involvement and critical thinking in working with scientific representations. Evaluating or selecting models to predict or explain phenomena also received a high mean of 4.50, showing that respondents value aligning models with instructional goals. The low standard deviations suggest consistent responses across participants.

Other indicators, such as evaluating student models and generating diagnostic questions (both WM = 4.30), were slightly lower but still interpreted as "Strongly Agree." This indicates that assessing students' understanding through models and targeted questioning is recognized as important, though slightly less emphasized than actively involving students in model creation and critique. Overall, the findings suggest that respondents strongly support the use of scientific models and representations as tools for both teaching and assessing understanding, with all indicators reflecting a consistently high level of agreement.

Teacher competence in using models and representations—such as diagrams, charts, simulations, and physical models—helps students visualize and understand abstract scientific concepts. According to Duit and Treagust (2003), the use of well-designed models in science instruction allows students to manipulate variables, visualize interactions, and build mental models of scientific phenomena, leading to a deeper understanding of the content.

Summary of Competence

Table 22 Summary of Competence

Indicators	WM	SD	Interpretation
1. Instructional Goals, Big Ideas, And Topics	4.65	0.353	Strongly Agree
2. Investigations and Demonstrations	4.42	0.325	Strongly Agree
3. Resources	4.50	0.334	Strongly Agree
4. Ideas	4.46	0.328	Strongly Agree
5. Explanation	4.45	0.327	Strongly Agree
6. Models and Representations	4.50	0.334	Strongly Agree
Average Mean	4.50	0.333	Strongly Agree

With an average mean of 4.50, which is interpreted as "Strongly Agree," the data in Table 22 provide an overall summary of the level of competence in using innovative instructional tools in science instruction. This shows that respondents exhibit a very high level of competence across all identified areas. Among the indicators, instructional goals, big ideas, and topics obtained the highest mean of 4.65, showing that respondents are highly competent in organizing and aligning instruction with clear learning objectives. Similarly, resources and models and representations both received means of 4.50, reflecting strong competence in selecting appropriate materials and using representations to support understanding. The low standard deviations across all indicators suggest that responses are consistent among participants.

Other areas such as ideas (WM = 4.46), explanation (WM = 4.45), and investigations and demonstrations (WM = 4.42) also fall within the "Strongly Agree" range, indicating that respondents are highly capable in analyzing student thinking, delivering clear explanations, and implementing inquiry-based activities. Although these indicators have slightly lower means compared to others, the differences are minimal and still reflect a high level of competence. Overall, the findings show that respondents consistently exhibit strong competence in all aspects of utilizing innovative instructional tools, with no area falling below the "Strongly Agree" level.

Learners' Academic Performance

This part of the study deals with the academic performance of the grade 4 learners in four science competencies. Table 23 presents the results on the learners' academic performance.

Table 23 Most Essential Competencies – Science 4

Competencies	WM	SD	Interpretation
Compare different types of soil	6.45	0.636	Mastered
Recognize that water is one of the basic needs of plants and animals	6.21	0.611	Mastered
Identify the effect of different types of soil on the growth of plants	5.89	0.564	Closely Approximating Mastery
Participate in a guided investigation	5.65	0.519	Closely Approximating Mastery
Average Weighted Mean	6.05	0.582	Closely Approximating Mastery

6.16 – 7.00 Mastered 2.72 – 3.57 Low Mastery
5.30 – 6.15 Closely Approximating Mastery 1.86 – 2.71 Very Low Mastery
4.44 – 5.29 Moving Towards Mastery 1.00 – 1.85 Absolutely No Mastery
3.58 – 4.43 Average Mastery

The data in Table 23 show that learners demonstrate a generally high level of competence in the Most Essential Competencies in Science 4, with an overall average weighted mean of 6.05, interpreted as "Closely Approximating Mastery." Two competencies, comparing different types of soil (WM = 6.45) and recognizing that water is a basic need of plants and animals (WM = 6.21), fall under the "Mastered" level. This indicates that learners have a strong understanding of these fundamental concepts. The relatively low standard deviations suggest that learners' performance in these areas is consistent.

On the other hand, identifying the effect of different types of soil on plant growth (WM = 5.89) and participating in guided investigations (WM = 5.65) are interpreted as "Closely Approximating Mastery." This shows that while learners are nearing mastery, there is still some variability in their understanding and skills in these areas. Overall, the results indicate that learners are performing well in the selected competencies, with most already achieving or approaching mastery levels.

Academic performance in Grade 4 science is influenced by various factors, including students' ability to grasp core scientific concepts, engage in hands-on activities, and apply critical thinking to solve problems. At this stage, learners are expected to develop foundational skills in observation, experimentation, and inquiry-based learning, as well as build a solid understanding of key topics such as ecosystems, matter, and energy. According to Duran and Duran (2004), the use of interactive, student-centered teaching methods enhances engagement and improves learning outcomes. Furthermore, academic performance is closely linked to the quality of teaching, with well-structured lessons and the effective use of resources helping students connect theoretical knowledge to real-world applications. As students in Grade 4 continue to develop cognitive and reasoning skills, their performance in science can significantly improve when they are actively engaged and supported in their learning process.

Significant Relationships

Utilization of Innovative Instructional Tools and Competence in Teaching Science 4

Table 24 Utilization of Innovative Instructional Tools and Competence in Teaching Science 4

	Computed r- value	Critical p-value	Decision on Ho	Interpretation
Utilization of the innovative instructional tools and the level of Competence in teaching Science 4	0.782	0.0038	Reject Ho	Significant

@ 0.05 level of significance

The data in Table 24 reveal a strong and significant relationship between the utilization of innovative instructional tools and the level of competence in teaching Science 4, as indicated by the computed r-value of 0.782. This suggests a high positive correlation, meaning that as the use of innovative instructional tools increases, the level of teaching competence also tends to increase. The p-value of 0.0038 is lower than the 0.05 level of significance, leading to the rejection of the null hypothesis. This confirms that the observed relationship is statistically significant and not due to chance.

Overall, the findings indicate that the extent to which teachers utilize innovative instructional tools is closely associated with their competence in teaching Science 4. The strong correlation highlights that both variables move in the same direction, with higher utilization corresponding to higher competence levels. This suggests a clear connection between the use of varied instructional tools and effective teaching practices, as reflected in the significant result.

Utilization of Innovative Instructional Tools and Learners' Academic Performance

Table 25 Utilization of Innovative Instructional Tools and Learners' Academic Performance

	Computed r- value	Critical p-value	Decision on Ho	Interpretation
Utilization of the innovative instructional tools and Academic Performance	0.405	0.0132	Reject Ho	Significant

@ 0.05 level of significance

The data in Table 25 show a statistically significant relationship between the utilization of innovative instructional tools and learners' academic performance, as indicated by the computed r-value of 0.405. This reflects a moderate positive correlation, suggesting that increased use of innovative instructional tools is associated with improved academic performance among learners. The p-value of 0.0132 is lower than the 0.05 level of significance, leading to the rejection of the null hypothesis. This confirms that the relationship observed is significant and not due to chance.

Overall, the findings indicate that while the relationship is not as strong as other variables, there is still a meaningful connection between the use of innovative instructional tools and learners' academic outcomes. As the level of utilization increases, learners' performance also tends to improve. This suggests that the integration of innovative tools in teaching may contribute positively to learners' academic achievement.

Issues and Concerns in Teaching Science

Table 26 Issues and Concerns in Teaching Science

Issues and Concerns	Frequency
Insufficient access to science lab equipment, textbooks, or multimedia resources that enhance learning.	9
The pressure to cover all required content within a limited timeframe leaves little room for hands-on activities or deeper exploration.	7
Struggling with learners who lack interest or motivation to learn science	7
Difficulty in designing effective assessments that accurately measure both knowledge and practical skills in science.	6
Inadequate opportunities for teachers to receive ongoing training on the latest teaching strategies, technologies, or scientific advancements.	5
Challenges in using technology effectively due to lack of training, infrastructure, or technical issues.	5
Difficulty in making science concepts engaging and relevant to students, particularly in abstract or complex topics.	5
Challenges in meeting the varied learning needs and abilities of students in a science classroom.	3
A dense and broad curriculum that leaves little time for in-depth exploration of scientific concepts.	2
Managing diverse student behaviors and maintaining an orderly environment, especially during practical or experimental sessions.	1

The data in Table 26 present the key issues and concerns encountered in teaching Science, with varying frequencies reported by respondents. The most prominent concern is insufficient access to science lab equipment, textbooks, or multimedia resources, with the highest frequency of 9. This indicates that lack of adequate instructional materials is a major challenge in delivering effective science instruction. According to the OECD (2023), educational material includes textbooks, ICT equipment, library resources, and laboratory materials, and shortages in these resources hinder schools' capacity to provide effective instruction. In science, this problem is especially serious because inquiry-based teaching depends on apparatus, print and media resources, and functioning learning spaces, not just teacher explanation.

Other commonly reported concerns include the pressure to cover all required content within limited time and learners' lack of interest or motivation, both with a frequency of 7. These findings show that both structural constraints and student-related factors affect the teaching and learning process in science. OECD (2020) explains that curriculum overload happens when schools try to achieve both breadth and depth within limited instructional time, leading coverage to be prioritized over deep understanding. The report notes that broad content is often taught at the expense of in-depth learning, even though studying fewer topics more deeply tends to strengthen richer understanding and higher-order thinking.

Additionally, difficulties in designing effective assessments (6) and limited opportunities for teacher training (5) highlight concerns related to instructional practices and professional development. Erduran, El Masri, Cullinane, and Ng (2020) likewise observed that the way practical science is assessed in high-stakes systems has major consequences for how it is taught; if assessment is too narrow, classroom practice can deteriorate into mechanical procedures rather than thoughtful scientific investigation. The difficulty for teachers, therefore, is not only writing test items but creating valid, reliable, and feasible assessments that capture conceptual understanding, procedural skill, scientific reasoning, and performance under real classroom constraints. This makes assessment in science more complex than in subjects where performance can be measured largely through written responses.

Challenges in using technology, making science concepts engaging, and addressing diverse learning needs (with frequencies ranging from 3 to 5) further indicate areas where teachers encounter obstacles. Meanwhile, concerns such as a dense curriculum (2) and managing student behavior (1) were reported less frequently. Langelaan, Gaikhorst, Smets, and Oostdam (2024) further showed that successful teacher preparation for differentiation requires active learning, collaboration, reflection, and attention to the contextual realities of schools. In science classrooms, this challenge is intensified because learners often differ not only in reading level or pace, but also in conceptual background, practical skill, and confidence with abstract reasoning. OECD (2020) states that

curriculum overload results when too many topics are expected to be taught within the available time, producing "more learning" in appearance but less deep learning in practice. The report emphasizes that excessive breadth often displaces depth, even though depth is what supports transfer, richer understanding, and higher-order thinking.

Overall, the data suggest that resource limitations, time constraints, and student engagement are the most pressing issues, while other concerns are present but less commonly experienced.

Summary of Findings

The study involved varying demographic and professional backgrounds of the teachers. Most of the teachers were between the ages of 41 to 50, female, married, with Certificate of Academic Requirements, had served for 16-20 yrs. in school, and had attended division level training and seminars. On the other hand, most of the learners were 10 years old and female.

The findings reveal that the extent of utilization of instructional tools for teaching Science 4 shows that the use of digital and technology-enhanced tools is at a very great extent, while foundational and interactive, student-centered tools are used to a great extent. The experiential and hands-on tools are utilized to a moderate extent. Overall, the average indicates that the utilization of instructional tools in Science 4 is generally at a great extent. Meanwhile, the level of competence in utilizing innovative instructional tools for teaching Science, is strongly agree in all areas, including instructional goals, investigations and demonstrations, resources, ideas, explanations, and models and representations. The average mean indicates that overall, there is a strong agreement on the teachers' competence in effectively using these instructional tools. On the other hand, the academic performance of the learners in science 4 competencies is Closely Approximating Mastery.

The study found a substantial correlation between the extent of utilization of innovative instructional tools, the teacher's competence and learners' academic performance. Teachers also face challenges such as limited access to essential resources, tight timeframes that limit hands-on activities, and students lacking motivation. Designing assessments that measure both knowledge and skills is difficult, and there are few opportunities for ongoing teacher training. Technology use is hindered by inadequate training and infrastructure, and making complex science concepts engaging remains a struggle. The broad curriculum leaves little time for in-depth exploration, and managing diverse student behaviors during experiments adds to the difficulty of maintaining an orderly classroom administrative and policy support, teacher burnout and workload.

Output of the Study

The proposed Innovative Instructional Tools Utilization Plan was informed by the findings at Garcia Elementary School. Instructional-tool utilization was rated Great Extent overall (WM = 3.84), with digital and technology-enhanced tools rated highest (4.22) and experiential and hands-on tools lowest (3.36). Teacher competence obtained an overall mean of 4.50, while learner performance obtained 6.05, interpreted as Closely Approximating Mastery. The reported positive relationships with teaching competence ($r = 0.782$, $p = 0.0038$) and academic performance ($r = 0.405$, $p = 0.0132$), together with concerns about resources, time, learner motivation, assessment, and training, provided the basis for the proposed support activities.

The supplied plan proposes workshops, hands-on digital training, student-centered activities, field trips, experiments, resource reviews, models and visual aids, shared strategies, mentorship, and continuing assessment. It identifies timeframes, target indicators, resources, responsible personnel, and budget requirements, with PTA/canteen funding specified where supplied. The complete rationale, objectives, approval route, target clientele, and eleven priority-area records follow. Targets such as a 20% increase in engagement and 90% participation are proposed implementation indicators, not effects measured by this study; the reported correlations do not establish causation.

Innovative Instructional Competence Plan

School Year 2026-2027

Rationale

The Innovative Instructional Competence Plan for Garcia Elementary School aims to enhance the pedagogical capabilities of Science 4 teachers by equipping them with the knowledge and skills required to effectively utilize innovative instructional tools. In the ever-evolving educational landscape, integrating technology, hands-on learning, and student-centered approaches into teaching methods has become crucial. This plan is designed to address the current needs of the Science 4 teachers at Garcia Elementary School by focusing on four main

components: foundational tools, digital and technology-enhanced tools, interactive and student-centered learning, and experiential and hands-on learning.

By improving the competency of the teachers in these areas, the plan seeks to foster a more engaging and effective learning environment for students. The implementation of this plan will ensure that the teachers are better prepared to meet the demands of modern education while also encouraging students to actively participate in their learning process. Ultimately, the goal is to create a science classroom that is dynamic, interactive, and capable of sparking curiosity and a deeper understanding of the subject matter.

This plan will be conducted over a period of time, with various strategies and activities designed to enhance the instructional competence of Garcia Elementary School's Science 4 teachers, thereby improving the overall quality of science education at the school.

Objectives

This plan for Garcia Elementary School aims to enhance the pedagogical capabilities of science 4 teachers by equipping them with the knowledge and skills required to effectively utilize innovative instructional tools. Specifically, it seeks to:

To enhance teachers' competence in using foundational instructional tools for teaching Science 4, ensuring that they have a strong base to build their lessons upon.

To train teachers in utilizing digital and technology-enhanced tools in the classroom, thereby allowing them to integrate modern technological resources to facilitate a more engaging and interactive learning experience.

To develop teachers' ability to implement interactive and student-centered teaching strategies, encouraging collaboration, critical thinking, and independent learning among students.

To provide teachers with the knowledge and skills to organize and conduct experiential and hands-on learning activities, promoting real-world applications of scientific concepts through practical activities and field trips.

To introduce innovative teaching ideas and strategies, promoting continuous professional development and the sharing of best practices among the teaching staff.

Scheme of Implementation

This output will be submitted to the District Supervisor for preliminary approval and be endorsed to the Division Office for validation and for deliberation and possible appropriate action.

Target Clientele

The participants for this Innovative Instructional Competence Plan are the science teachers of Garcia Elementary School.

Innovative Instructional Tools Utilization Plan

Priority Area 1

Table 27 Foundational Tools

Field	Plan Details
AREAS OF CONCERN	Foundational Tools
OBJECTIVES	Increase knowledge of foundational tools for teaching Science 4
STRATEGY	Provide workshops on the use of basic teaching tools
TIME FRAME	2 weeks
TARGET/OUTPUT INDICATOR	Teachers report improved tool usage in lesson plans
RESOURCES NEEDED	Teaching manuals, projector, markers
PERSON RESPONSIBLE	School Head, Science Coordinator and Teachers
BUDGET REQUIREMENTS – Amount	Php 10, 000
BUDGET REQUIREMENTS – Source	PTA / Canteen Funds

Priority Area 2

Table 28 Digital & Technology-Enhanced Tools

Field	Plan Details
AREAS OF CONCERN	Digital & Technology-Enhanced Tools
OBJECTIVES	Train teachers to effectively integrate digital tools in Science 4
STRATEGY	Conduct hands-on training on digital teaching tools (e.g., simulation software)
TIME FRAME	1 month
TARGET/OUTPUT INDICATOR	Teachers successfully integrate digital tools in their classes
RESOURCES NEEDED	Computers, software, internet connection
PERSON RESPONSIBLE	IT Specialist, School Head, Science Coordinator and Teachers
BUDGET REQUIREMENTS – Amount	Php 15, 000
BUDGET REQUIREMENTS – Source	PTA / Canteen Funds

Priority Area 3

Table 29 Interactive & Student-Centered Approaches

Field	Plan Details
AREAS OF CONCERN	Interactive & Student-Centered Approaches
OBJECTIVES	Foster engagement through interactive methods
STRATEGY	Implement group activities and student-led demonstrations
TIME FRAME	3 weeks
TARGET/OUTPUT INDICATOR	Student engagement rate increases by 20%
RESOURCES NEEDED	Group work materials, classroom space
PERSON RESPONSIBLE	School Head, Science Coordinator and Teachers
BUDGET REQUIREMENTS – Amount	Php 15, 000
BUDGET REQUIREMENTS – Source	PTA / Canteen Funds

Priority Area 4

Table 30 Experiential & Hands-On Learning

Field	Plan Details
AREAS OF CONCERN	Experiential & Hands-On Learning
OBJECTIVES	Promote hands-on learning experiences
STRATEGY	Organize field trips and lab experiments
TIME FRAME	1 month
TARGET/OUTPUT INDICATOR	90% of students participate in at least one hands-on activity
RESOURCES NEEDED	Lab equipment, transportation for field trips
PERSON RESPONSIBLE	School Head, Science Coordinator and Teachers
BUDGET REQUIREMENTS – Amount	Php 30, 000
BUDGET REQUIREMENTS – Source	PTA / Canteen Funds

Priority Area 5

Table 31 Instructional Goals & Big Ideas

Field	Plan Details
AREAS OF CONCERN	Instructional Goals & Big Ideas
OBJECTIVES	Align lesson objectives with core scientific concepts
STRATEGY	Ensure each lesson has clear and measurable objectives
TIME FRAME	Ongoing throughout semester
TARGET/OUTPUT INDICATOR	All lesson plans align with curriculum goals
RESOURCES NEEDED	Curriculum guides, lesson plan templates
PERSON RESPONSIBLE	School Head, Science Coordinator and Teachers
BUDGET REQUIREMENTS – Amount	Php 10,000
BUDGET REQUIREMENTS – Source	

Priority Area 6

Table 32 Investigations & Demonstrations

Field	Plan Details
AREAS OF CONCERN	Investigations & Demonstrations
OBJECTIVES	Improve skills in conducting scientific investigations
STRATEGY	Run practice demonstrations and group investigations
TIME FRAME	2 week
TARGET/OUTPUT INDICATOR	Teachers report increased confidence in conducting investigations
RESOURCES NEEDED	Lab equipment, science kits
PERSON RESPONSIBLE	School Head, Science Coordinator and Teachers
BUDGET REQUIREMENTS – Amount	Php 50, 000
BUDGET REQUIREMENTS – Source	PTA / Canteen Funds

Priority Area 7

Table 33 Resources

Field	Plan Details
AREAS OF CONCERN	Resources
OBJECTIVES	Ensure adequate resource availability for teaching
STRATEGY	Regularly assess and update resource inventory
TIME FRAME	Monthly
TARGET/OUTPUT INDICATOR	Inventory updated with necessary resources
RESOURCES NEEDED	Resource catalog, budget
PERSON RESPONSIBLE	School Head, Science Coordinator and Teachers
BUDGET REQUIREMENTS – Amount	Php 30, 000
BUDGET REQUIREMENTS – Source	PTA / Canteen Funds

Priority Area 8

Table 34 Explanations & Models

Field	Plan Details
AREAS OF CONCERN	Explanations & Models
OBJECTIVES	Enhance teaching clarity with better models and visual aids
STRATEGY	Introduce more models and visual aids in lessons
TIME FRAME	3 weeks
TARGET/OUTPUT INDICATOR	Teacher feedback indicates improved clarity of lessons
RESOURCES NEEDED	Models, visual aids, projector
PERSON RESPONSIBLE	Science Teachers, Visual Aid Specialist
BUDGET REQUIREMENTS – Amount	Php 30, 000
BUDGET REQUIREMENTS – Source	PTA / Canteen Funds

Priority Area 9

Table 35 Ideas & Innovations

Field	Plan Details
AREAS OF CONCERN	Ideas & Innovations
OBJECTIVES	Encourage new teaching ideas and strategies
STRATEGY	Organize a monthly meeting for teachers to share strategies
TIME FRAME	Ongoing
TARGET/OUTPUT INDICATOR	New ideas and strategies are shared every month
RESOURCES NEEDED	Meeting room, collaborative tools
PERSON RESPONSIBLE	Science Coordinator
BUDGET REQUIREMENTS – Amount	Php 30, 000
BUDGET REQUIREMENTS – Source	PTA / Canteen Funds

Priority Area 10

Table 36 Mentorship

Field	Plan Details
AREAS OF CONCERN	Mentorship
OBJECTIVES	Collaborative practice and leadership
STRATEGY	Conduct regular collaborative planning meetings among teachers, and school leaders to strengthen shared decision-making and teamwork
TIME FRAME	Quarterly
TARGET/OUTPUT INDICATOR	At least 2 or more collaborative planning meeting conducted every quarter with documented action plans and attendance
RESOURCES NEEDED	Meeting venue, attendance sheets, planning template, communication materials
PERSON RESPONSIBLE	School Head, Teachers
BUDGET REQUIREMENTS – Amount	Php 30, 000
BUDGET REQUIREMENTS – Source	PTA / Canteen Funds

Priority Area 11

Table 37 Assessment and Continuous Improvement

Field	Plan Details
AREAS OF CONCERN	Assessment and Continuous Improvement
OBJECTIVES	Use of Digital tools in assessment
STRATEGY	Implement regular monitoring and evaluation of programs and learner progress to identify gaps and improve strategies
TIME FRAME	Every end of quarter
TARGET/OUTPUT INDICATOR	Quarterly assessment report completed and improvement plan prepared based on findings
RESOURCES NEEDED	Assessment tools, monitoring forms, learner records, reporting template
PERSON RESPONSIBLE	School Head, Teachers, Monitoring and Evaluation Coordinator
BUDGET REQUIREMENTS – Amount	Php 30, 000
BUDGET REQUIREMENTS – Source	PTA / Canteen Funds

Proponent:
VIDALA L. BARBARONA

CONCLUSION

Based on the findings of the study, it can be concluded that the extent of utilization of innovative instructional tools and the level of competence in teaching science and learners' academic performance have a significant relationship with each other.

RECOMMENDATION

The following recommendation was offered: Utilization of the innovative instructional competence plan for the teachers at Garcia Elementary School.

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