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Multimedia Integration in Science Instruction: Proficiency Training Plan

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Abstract: This study assessed the extent of multimedia integration among science teachers of Bayongan Elementary School, San Miguel District, Division of Bohol for the School Year 2025–2026. Specifically, it examined the teachers' demographic and professional profiles—including age, gender, civil status, educational attainment, years of service, and related trainings—as well as the learners' age and gender. The study also determined the extent of teachers' utilization of multimedia instructional tools in terms of text, graphic, audio, video, and interactive media, and explored their perceptions of multimedia integration in the instructional, communication, organizational, analytical, and expansive domains. A descriptive–correlational research design was employed using an adapted and modified questionnaire as the main data-gathering instrument. Findings revealed that most teachers were female, aged 41–50 years, married, bachelor's degree holders, with 16–20 years of teaching experience, and had attended division-level trainings. The majority of learners were 10 years old and female. Results showed that multimedia instructional tools were utilized to a great extent, with audio and graphic tools being the most frequently used, followed by text, video, and interactive media. Teachers demonstrated positive perceptions toward multimedia integration, recognizing its effectiveness in enhancing instruction, communication, organization, and analytical and expansive thinking skills. A significant correlation was found between the extent of multimedia integration and learners' proficiency in science. Challenges identified included limited access to technology, inadequate teacher training, technical issues, time constraints, inequities, maintenance and sustainability concerns, poor internet connectivity, teacher resistance, assessment difficulties, and student distractions. The study concludes that greater multimedia integration is significantly associated with higher learner proficiency in science. It is recommended that a multimedia digital training plan be implemented in School Year 2026–2027 to further strengthen teachers' capacity for effective multimedia integration.

Keywords: Administration Supervision, Multimedia Integration, Learners' Proficiency, Multimedia Digital Training Plan, Descriptive-Correlational, Bohol, Philippines.

CHAPTER 1

THE PROBLEM AND ITS SCOPE

INTRODUCTION

Rationale of the Study

Science education builds the human capital, inquiry skills, and scientific literacy that underpin innovation, evidence-based policy, and a technology-ready workforce. Strong science education produces future researchers, engineers, technicians, and informed citizens able to understand and act on socio-scientific issues (e.g., public health, climate change) all critical inputs to national competitiveness and resilience. International reviews and policy analyses stress that investment in science education is a cornerstone of national S&T capacity (UNESCO, 2021).

High-quality science education must be equitable. Evidence shows marginalized students lose most in crises (e.g., pandemic school closures), and girls and rural learners often face structural barriers into STEM pathways. Embedding local contexts (indigenous knowledge, local environmental issues) and culturally responsive pedagogy helps make science relevant and inclusive, improving engagement and retention (World Bank, 2022).

In the 2022 cycle of the Programme for International Student Assessment (PISA), Philippine 15-year-old students achieved an average science score well below the global benchmark: only 23% of students reached at least Level 2 proficiency in science (versus the OECD average of 76%) and almost none attained Levels 5–6, which indicate high-order scientific reasoning. This places the country among the bottom performers (third-lowest in science among the 81 participating economies), underscoring significant challenges in developing scientific literacy and problem-solving skills in real-life contexts.

The Department of Education (DepEd) and the Department of Science and Technology–Science Education Institute (DOST-SEI) have implemented various programs aimed at strengthening STEM instruction, such as teacher training, curriculum enhancement, and scholarship opportunities for future scientists and engineers. According to DOST-SEI (2021), initiatives like the *Science for Human Capital* program and the expansion of science high schools nationwide are designed to produce a pool of highly skilled professionals who can contribute to national progress through research, innovation, and technology development.

However, despite these efforts, science education in the country continues to face challenges, including inadequate laboratory facilities, limited access to updated learning materials, and varying levels of teacher preparedness, particularly in implementing inquiry-based and technology-integrated instruction. Recent studies emphasize the need for continuous teacher professional development and context-based science instruction to make learning more relevant and equitable across diverse regions of the country (Reyes et al., 2023). Strengthening collaboration between schools, government agencies, and industries is vital to enhance the quality of science education and ensure that it aligns with the country's vision for a science-driven and globally competitive economy.

Moreover, multimedia integration plays a vital role in enhancing science education by making abstract and complex scientific concepts more accessible, engaging, and meaningful to learners. Through the use of animations, simulations, videos, and interactive presentations, multimedia allows students to visualize phenomena that are otherwise difficult to observe in traditional classroom settings. Studies show that multimedia-supported instruction significantly improves students' conceptual understanding, retention, and motivation to learn science because it appeals to multiple senses and learning styles (Mayer, 2021). When teachers incorporate multimedia tools effectively, learners not only grasp theoretical knowledge but also develop critical thinking and problem-solving skills as they interact with digital learning environments.

Multimedia platforms such as virtual laboratories, augmented reality (AR), and educational videos have enabled continuity of science learning even amid limited physical interaction. According to Cabansag and Magsino (2022), the integration of multimedia resources in Philippine science classrooms has improved learners' engagement and participation, particularly when teachers are trained to align digital tools with learning competencies. These innovations have transformed the teaching and learning process from being teacher-centered to more student-driven, allowing learners to explore, experiment, and construct knowledge at their own pace.

In the Philippine context, multimedia integration supports the Department of Education's goal of promoting 21st-century skills and digital literacy among learners. The Department of Science and Technology–Science Education Institute (DOST-SEI, 2021) also encourages the use of technology-enhanced teaching as part of its STEM education programs to strengthen scientific inquiry and innovation. Despite challenges such as limited infrastructure and uneven access to technology in rural areas, the effective use of multimedia can bridge gaps in science learning by providing equitable and interactive educational experiences. Therefore, multimedia integration is not merely a supplemental tool but a transformative approach that enhances students' scientific understanding, creativity, and readiness for future scientific and technological endeavors.

Studying the integration of multimedia in science education and its impact on the proficiency level of learners at Bayongan Elementary School, San Miguel District, Division of Bohol for School Year 2025–2026 is crucial in identifying how digital tools can enhance understanding and performance in science. This investigation will provide empirical evidence on how interactive videos, simulations, and digital experiments influence learners' comprehension, engagement, and retention of scientific concepts. The findings will serve as the foundation for the DIGISCI Training Program: Digital Integration in Science Instruction, a capacity-building initiative aimed at equipping teachers with the necessary skills and strategies to effectively integrate multimedia in classroom teaching. By determining the relationship between multimedia integration and learners' science proficiency, the study will not only address existing instructional gaps but also support the school's goal of promoting 21st-century learning competencies, aligning with the Department of Education's thrust toward quality, technology-driven, and learner-centered science instruction.

Theoretical Background

The research anchors the study on the following theories: Constructivist Learning Theory (Piaget, Vygotsky), Cognitive Theory of Multimedia Learning (Richard Mayer, 2001), Technological Pedagogical Content Knowledge (TPACK) Framework (Mishra & Koehler, 2006), Experiential Learning Theory (Kolb, 1984) and Inquiry-Based Learning Theory.

Constructivism (drawing on Piaget's emphasis on active cognitive construction and Vygotsky's sociocultural view of learning through mediated social activity) frames learners as builders of knowledge rather than passive recipients. In this view learners construct mental models by interacting with the environment, testing hypotheses, negotiating meanings with peers, and using cultural tools (including language and representational systems) to scaffold understanding. Recent syntheses continue to emphasize both the individual-cognitive (Piagetian) and socially mediated (Vygotskian) strands as complementary for classroom practice (Chand, 2023).

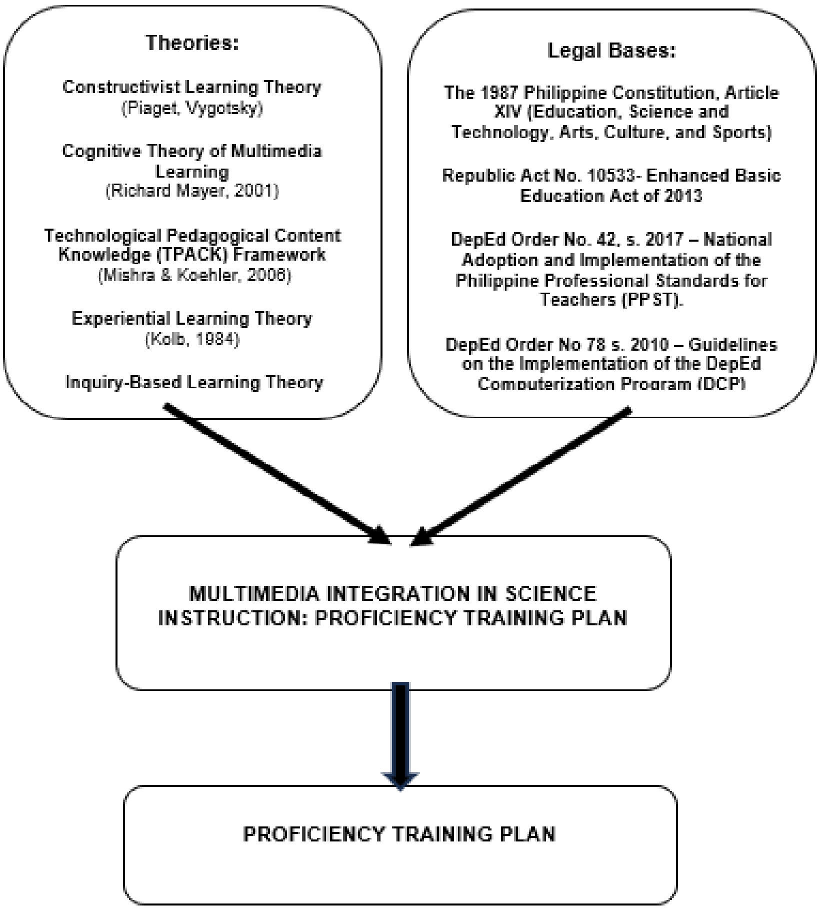

Figure 1. Theoretical Framework

In addition, Chand (2023) added that when multimedia is introduced from a constructivist stance in science education, it is treated as a set of cognitive and social tools that learners use to build and externalize understanding (e.g., simulations to test ideas, datasets to interpret, concept-mapping tools to organize

reasoning). Multimedia environments that support learner control, multiple representations (e.g., graphs, animations, text), and social interaction (collaborative annotations, shared simulations) map neatly onto Piagetian exploratory learning and Vygotskyan scaffolding — allowing teachers to fade support as students move toward independent reasoning. Recent classroom studies and reviews note that constructivist-aligned multimedia tasks (guided exploration, collaborative data inquiry) improve engagement and conceptual change in science topics.

Practically this means designing multimedia science lessons that create cognitive conflict, provide manipulable representations, and embed opportunities for social negotiation and teacher scaffolding (e.g., teacher prompts, peer critique, zone-of-proximal-support tasks). Teachers are advised to combine open exploration with focused guidance (structured inquiry using multimedia), and assessments should privilege explanation, model-building, and evidence-based argumentation rather than rote recall.

On the other hand, Mayer (2024) proposed that Cognitive Theory of Multimedia Learning (CTML), people learn better from words and pictures than from words alone because of (1) dual channels (separate visual/pictorial and auditory/verbal processing), (2) limited capacity in each channel, and (3) active processing (selecting, organizing, integrating). Over the last few years Mayer and colleagues have revisited and refined CTML principles (e.g., signaling, segmenting, modality, coherence) to align them with new digital media and research on cognitive load. Contemporary reviews re-state CTML's foundational assumptions while updating design implications for modern multimedia (interactive animations, VR, and adaptive systems).

In science education, CTML gives concrete design heuristics: reduce extraneous material, break complex animations into learner-paced segments, use complementary modalities (narration with visuals rather than on-screen text plus narration), and provide cues/signals to guide attention to the relevant features of a diagram or simulation. Practical guidance for teachers/designers: chunk complex demonstrations (segmenting), present narration rather than dense on-screen text (modality principle), cue key features (signaling), and pre-teach core elements (pre-training) all shown to improve comprehension and transfer in science multimedia lessons. Several field studies and practitioner guides show how following CTML principles raises learning outcomes in online and blended science units (Mayer, 2024). In addition, science topics often involve dynamic phenomena (e.g., molecular motion, ecosystems, forces) that are difficult to grasp via text alone, multimedia presentations that combine words (spoken or written) with relevant visuals allow learners to build both verbal and pictorial mental models and then integrate them into coherent knowledge structures.

Mayer and Moreno (2005) highlight that multimedia tools like animations, simulations, and interactive exercises facilitate *active cognitive processing*, which is vital for meaningful learning. For example, in a simulation showing chemical reactions, students who hear an accompanying explanation while observing molecular movement are more likely to grasp cause-and-effect relationships. This aligns with the *modality principle*, which suggests that learning improves when words are presented as spoken text rather than written text alongside animation (Mayer & Moreno, 2005). In addition, interactive exercises allow students to manipulate variables—such as temperature or force—and receive real-time feedback, reinforcing the CTML's assertion that learners benefit from engaging both channels and controlling their learning pace (Mayer & Moreno, 2005).

Moreover, TPACK frames teacher knowledge for technology integration as an intersection of Content Knowledge (CK), Pedagogical Knowledge (PK), and Technological Knowledge (TK). The core claim is that effective technology use depends not on technology alone but on how teachers align technological affordances with pedagogical strategies for specific content goals like the pedagogically situated use of technology for particular content.

To maximize multimedia learning in science classrooms, educators should apply evidence-based design principles derived from Mayer's (2005) framework. The *multimedia principle* suggests that learners understand concepts better when instruction includes both words and pictures. Similarly, the *temporal contiguity principle* advises presenting narration and visuals simultaneously to aid integration (Mayer & Moreno, 2005). The *coherence principle* further recommends removing unnecessary details that may distract learners and overload working memory. Applying these principles, teachers can design engaging, cognitively efficient multimedia lessons—through animations, simulations, and interactive experiments—that enhance both student interest and understanding of scientific concepts (Mayer, 2005; Mayer & Moreno, 2005).

In science education, TPACK studies emphasize that technology choices (e.g., simulations, data-logging apps, video probes) must be pedagogically matched to science content aims: simulations used for model-based reasoning, data tools for inquiry cycles, and visualization tools to reveal microscopic/abstract phenomena. The literature shows TPACK-informed professional development improves teachers' ability to design multimedia learning sequences that support inquiry and conceptual understanding (Amiruddin et al., 2024).

This means teacher education should build integrated experiences: content-rich tasks that require teachers to choose and justify multimedia tools, practice designing technology-supported investigations, and reflect on student learning outcomes. Administratively, schools should support ongoing professional learning (coaching, exemplar lesson banks) that foreground TPACK rather than one-off device training (Shambare & Jita, 2024).

Consequently, Kolb's Experiential Learning Theory (ELT) describes a four-stage cycle — concrete experience, reflective observation, abstract conceptualization, and active experimentation — that supports learning through doing and reflection. Recent adaptations (including the Kolb Experiential Learning Profile updates, 2021) and applied studies show ELT maps naturally onto multimedia: immersive experiences (virtual labs, AR/VR simulations) can serve as vivid "concrete experiences" that learners reflect on and iterate with (Kolb & Kolb, 2021).

Salinas-Navarro et al. (2024) discussed that when multimedia is applied in science education, ELT suggests multimedia should provide authentic, manipulable experiences (e.g., virtual experiments, data-collection apps), structured opportunities for reflection (logs, debriefs, concept-mapping), and spaces for testing revised hypotheses (re-running simulations, designing follow-up investigations). Virtual and AR/VR environments can instantiate concrete experiences that are otherwise impossible or unsafe in the real lab; when combined with structured reflection and opportunities for active re-testing, they map directly onto Kolb's cycle. Recent empirical studies demonstrate that well-designed virtual experiential labs and VR-enhanced activities—when coupled with reflection and iterative experimentation—improve procedural skill, conceptual understanding, and transfer in science learning.

Furthermore, inquiry-based learning centers, learning around questions, investigations, data collection/analysis, and evidence-based explanations—mirroring authentic scientific practice. Kamarudin et al. (2022) showed that technology-enhanced IBL (multimedia scaffolds, data collection tools, virtual experiments, and modeling environments) strengthens student inquiry practices and conceptual understanding, especially when digital tools are intentionally scaffolded into the inquiry cycle.

Multimedia supports every stage of an inquiry cycle: posing questions (interactive concept maps, multimedia prompts), planning and carrying out investigations (virtual labs, sensor-logging apps), analyzing data (dynamic graphs, simulation-model fitting), and communicating findings (multimodal reports, video explanations). Mobile and web-based tools make distributed data collection and collaboration easier, and simulations let students test variables quickly. Alarcon et al. (2023), emphasizes that unguided multimedia inquiry often leads to surface-level outcomes; guided inquiry with scaffolds (structured prompts, model-based supports, formative feedback) yields stronger gains in science understanding and practices.

Along with these theories, this research also anchors the following legal basis: The 1987 Philippine Constitution, Republic Act No. 10533, Republic Act No. 9155, and DepEd Order No. 42, s. 2017.

The 1987 Philippine Constitution, Article XIV (Education, Science and Technology, Arts, Culture, and Sports), this study aligns with the constitutional mandate to promote quality education by utilizing innovative methods—such as multimedia integration—to enhance science learning. By improving science proficiency, the research supports the State's goal of fostering scientific literacy and innovation.

Republic Act No. 10533, the K to 12 curriculum promotes 21st-century skills, including scientific literacy, critical thinking, and digital competence. The use of multimedia in science instruction supports these competencies by providing engaging, technology-based learning experiences.

DepEd Order No 78 s. 2010 – Guidelines on the Implementation of the DepEd Computerization Program (DCP), provides guidelines for the DepEd Computerization Program (DCP). The program's main goal is to improve the teaching and learning process by integrating Information and Communication Technology (ICT) in public schools, which includes providing computer laboratories, e-classrooms, and training.

DepEd Order No. 42, s. 2017, National Adoption and Implementation of the Philippine Professional Standards for Teachers (PPST), this policy requires teachers to be technologically proficient and use digital tools to support instruction. The study demonstrates teacher compliance with PPST standards by integrating multimedia to improve science teaching and learning outcomes.

THE PROBLEM

Statement of the Problem

This research assessed the extent of multimedia integration in Science Teaching in relation to learners' performance of Bayongan Elementary School, San Miguel, District of the Division of Bohol during the School Year 2025-2026 as a basis for DIGISCI multimedia training plan.

Specifically, this answered the following questions:

1. What is the demographic profile of the:

1.1 teacher

1.1.1 age and gender,

1.1.2 civil status,

1.1.3 highest educational attainment,

1.1.4 years in service,

1.1.5 relevant training/ seminar /workshop attended,

1.2 learners' age and gender?

2. As perceived by the respondents, what is the extent of utilization of multimedia instructional tools in terms of:

2.1 text,

2.2 graphic,

2.3 audio,

2.4 video, and

2.5 interactive media?

3. As perceived by the respondents, what is the perception on the extent of multimedia integration in terms of:

2.1 instructional,

2.2 communication,

2.3 organization,

2.4 analytical, and

2.5 expansive?

4. As perceived by the respondents, what is their proficiency level in Science as to the following competencies:

4.1 identifying the parts of the digestive system,

4.2 distinguishing the parts of the respiratory system, and

4.3 discerning the parts of the female and male reproductive system?

5. Is there a significant relationship between the extent of multimedia integration and the proficiency level of the learners?

6. What are the issues and concerns of integrating multimedia in science teaching?

7. Based on the findings, what multimedia digital training plan can be developed?

Null Hypothesis

There is no significant between the extent of multimedia integration and the proficiency level of the learners. The null hypothesis given will be tested at a 0.05 level of significance.

Significance of the Study

This study is beneficial for the following:

Education Policy Makers. This study provides data-driven insights that can guide the formulation of policies promoting the integration of multimedia tools to enhance science education.

Department of Education. The results can serve as a basis for developing national initiatives and training programs that promote technology-enhanced learning in science.

School/ Educational Institution. The findings can help institutions design more effective science programs that leverage multimedia to improve student engagement and achievement.

The Administrators. This study offers strategies for implementing multimedia-based teaching innovations to improve academic performance and teaching efficiency.

School heads. It equips school leaders with evidence to support and sustain multimedia integration in science instruction for better learning outcomes.

Teachers. The study provides practical approaches for integrating multimedia tools to make science concepts more accessible and engaging for learners.

Learners. It enhances students' understanding and interest in science by offering interactive and visually enriched learning experiences.

Society/Community. Improved science proficiency among learners contributes to a more scientifically literate and technologically competent community.

The Researcher This study expands the body of knowledge on multimedia integration and its impact on science education effectiveness.

Future researchers. It serves as a foundation for further studies on technology-based instructional strategies that can enhance learning across various subjects.

RESEARCH METHODOLOGY

This part contains the research methodology which includes the method used, the flow of the study, research locale, research respondents, research instruments, data gathering procedures, statistical treatment of data, scoring procedures and definition of terms.

Design

The study used a descriptive-survey research design to collect information on the extent of multimedia integration of the science teachers and proficiency level of the learners of the set competencies of Bayongan Elementary School, San Miguel District of the Division of Bohol.

The design was deemed appropriate for the study as the research instrument was survey-based. The percentage, frequency, weighted mean, standard deviation, and Pearson correlation were the statistical techniques that were employed. Moreover, a noteworthy correlation between the specified variables was ascertained, hence augmenting the relevance of the design.

Flow of the Study

The flow of the research followed the system approach of input, process, and output. The data needed on the input was the profile data of the teacher such as age, civil status, gender, highest educational attainment, years in service, relevant training/seminars attended and learners' age and gender.

Moreover, the input consists of the related information that was adopted to be able to acquire the required information on: (1) extent of multimedia integration, (2) learners' proficiency level (3) the extent of multimedia integration of the science teachers and the proficiency level of learners in terms of set competencies.

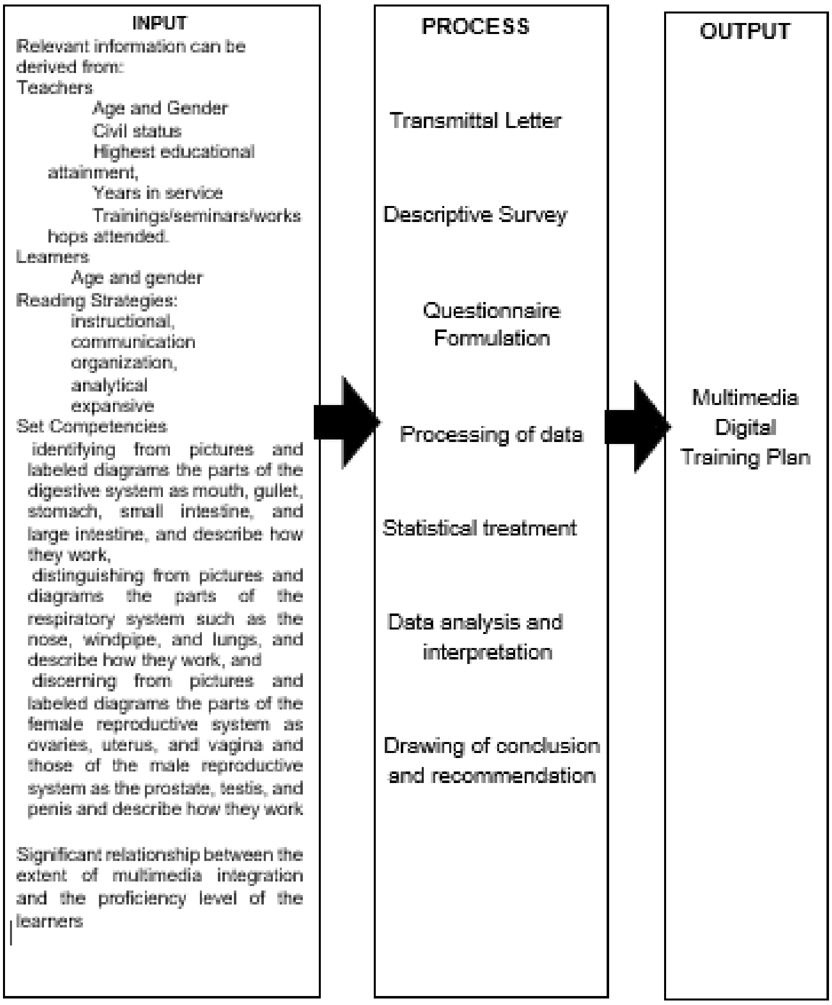

Figure 2. Flow of the Study

The first step taken in the study was the pre-data gathering procedure, where participating respondents were identified from which the data was gathered. It was then followed by the preparation of the questionnaire and the drafting of letters of request to the principal seeking approval to conduct the study. After the letter was approved, the respondents were given an online link through Google Form for the questionnaire.

Data was collected through a survey questionnaire, which was distributed to the randomly selected respondents. The instrument was divided into four sections designed to gather information. To facilitate participation, the researcher ensured confidentiality by anonymizing responses and emphasizing the voluntary nature of the study.

Data was collected and submitted to the statistician for statistical treatment. Under the direction of the research adviser, it underwent additional presentation, analysis, and interpretation. Based on the results and findings, multimedia digital training plan was proposed.

Environment

The research was conducted at Bayongan Elementary School, located within the San Miguel District of the Division of Bohol.

Bayongan Elementary School is a public elementary institution located along Loay Interior Road, Barangay Bayongan, San Miguel, Bohol. It serves not only the children of Bayongan but also learners from surrounding barangays. Geographically, it is bounded by Barangay San Vicente to the southeast,

Figure 3. Location of the Environment

Cambangay Norte to the south, Corazon to the east, and the municipality of Ubay to the north. Bayongan is one of the largest barangays in San Miguel, known for its fertile agricultural lands and the Bayongan Dam, which supports local farming and irrigation. The school, situated at the heart of the community, reflects the value the residents place on education.

The origins of Bayongan Elementary School trace back to the post-war years, when classes were first conducted in temporary nipa and bamboo structures. This initiative was led by community leaders and parents who recognized the need for formal education. With the support of local officials and the Department of Education, the first permanent classrooms were constructed in the 1960s, initially accommodating more than twenty Grade 1 pupils under a single teacher. Additional classrooms were gradually added, and by the 1980s, the school was recognized as a complete elementary school offering Grades 1 to 6. Its steady growth was bolstered by the Parent–Teacher Association, the barangay council, and external donors, all of whom supported building improvements, school programs, and pupil welfare.

Over the decades, Bayongan Elementary School has continued to expand and modernize. Older classrooms made of light materials were replaced with semi-concrete structures and, eventually, fully concrete buildings, providing a more resilient and conducive learning environment. Today, the school stands as a progressive institution that adapts to the evolving educational needs of its learners. It now implements the Revised Curriculum of Education (MATATAG K–10 Curriculum), which emphasizes foundational skills, values formation, and streamlined competencies. The MTB-MLE program is no longer implemented since the start of the revised curriculum, aligning instruction with the current educational framework. The school also actively participates in major national programs such as Brigada Eskwela, Buwan ng Wika, Nutrition Month, literacy campaigns, and the ARAL Program (National Learning Recovery Program), which provides remedial classes in reading, mathematics, and literacy.

For School Year 2024–2025, Bayongan Elementary School serves a total of 310 learners, supported by 13 teachers, led by 1 principal, and assisted by 1 administrative staff. With its dedicated personnel and strong community partnerships, the school continues to uphold its mission of delivering quality education grounded in values and excellence. From its humble beginnings in makeshift classrooms, Bayongan Elementary School has evolved into a stable and progressive educational institution that remains central to the life and future of the barangay.

Respondents

The respondents of the study were the 10 teachers and 60 grade 5 learners of Bayongan Elementary School.

Table 1 shows the distribution of the respondents.

Table 1. Distribution of Respondents

Respondent Groups	Frequency	Percentage
Teachers	10	14
Learners	60	86
Total	**70**	**100**

Instrument

The instrument was divided into three parts: a profile of the respondents, a survey form on teachers' multimedia integration, and learners' proficiency based on set competencies.

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 and gender.

The second component of the questionnaire focuses on multimedia integration, which was taken from the study of Amores (2025), entitled Assessing the impact of Technology-Based Multimedia Tools in pre-pandemic on senior high school students' learning performance. On the other hand, the third component, which was the set of competencies, was based on the Matatag Science Curriculum Guide, and the assessment materials were given by the Department of Education.

Data Gatheringg

First, an approval letter addressed to the school principal of Bayongan Elementary School was sent seeking approval to conduct the study.

After the letter was approved, a link to the questionnaire was distributed to the respondents. The respondents were given ample time, preferably 20-30 minutes, to answer the questionnaire. The learners' proficiency level was assessed through the formative and summative exams.

Data was collected and submitted to the statistician for statistical treatment. It was subjected to further presentation, analysis, and interpretation with the guidance of the research adviser.

A final draft was submitted for finalization and corrections.

Statistical Treatment of Data

Simple Percentage Analysis. Comparing two or more arrangements of information was 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 utilized to determine the significant relationship with the extent of multimedia integration and learners proficiency level based of competencies.

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 are from the mean, indicating the consistency or variability in the dataset.

Scoring Procedure

The following were the scoring procedures for extent of utilization of reading strategies.

Weight	Scale	Category	Verbal Description
5	4.20- 5.00	Very Great Extent	The teacher consistently integrates multimedia (videos, animations, simulations, interactive presentations, etc.) in almost all Science lessons to enhance understanding and engagement.
4	3.40- 4.19	Great Extent	The teacher often uses multimedia tools in teaching Science; multimedia is a regular part of instruction but not in all lessons.
3	2.60- 3.39	Moderate Extent	The teacher sometimes integrates multimedia in Science lessons, depending on the topic or availability of resources.
2	1.80- 2.59	Low Extent	The teacher seldom uses multimedia in Science instruction; lessons mostly rely on traditional teaching methods.
1	1.00-1.79	Very Low Extent	The teacher rarely or never integrates multimedia in teaching Science. Instruction is primarily textbook- or lecture-based.

Scoring Procedure for Teachers' Perception of Multimedia Integration

Weight	Scale	Category	Verbal Description
5	4.20- 5.00	Strongly Agree	The teacher has a very positive perception of multimedia integration and consistently supports or applies it in teaching.
4	3.40- 4.19	Agree	The teacher has a positive perception and often recognizes the benefits of multimedia integration in instruction.
3	2.60- 3.39	Neutral	The teacher is uncertain or indifferent toward multimedia integration; sees both advantages and disadvantages.
2	1.80- 2.59	Disagree	The teacher has a negative perception and seldom sees value in using multimedia for teaching.
1	1.00-1.79	Strongly Disagree	The teacher has a very negative perception and opposes or avoids multimedia integration in instruction.

Scoring Procedure for Learners' Proficiency Level

Weight	Scale	Category	Verbal Description
5	4.20- 5.00	Advance	Performs the competency consistently at an exceptional level; exceeds expectations.
4	3.40- 4.19	Proficient	Demonstrates the competency most of the time with only minor improvement areas.
3	2.60- 3.39	Approaching Proficiency	Demonstrates the competency adequately; meets minimum expectations.
2	1.80- 2.59	Developing	Demonstrates the competency inconsistently; needs improvement in several areas.
1	1.00-1.79	Beginning	Rarely demonstrates the competency; performance is below expectations.

DEFINITION OF TERMS

For better understanding and clarity, and to establish standard construction of meaning, the following terms had been given both conceptual and operational definitions:

Multimedia. Refers to the use of various digital tools and content forms such as text, images, audio, video, and animations integrated into science instruction to enhance learning and engagement.

Multimedia Digital Training Plan. A structured professional development training plan designed to train teachers in effectively using digital and multimedia resources to improve the teaching and learning of science concepts.

Multimedia Integration. The process of combining multiple media elements into lessons to create interactive and meaningful learning experiences.

Instructional. Refers to the design and delivery of lessons aimed at facilitating effective learning.

Communication. The exchange of ideas and information between teachers and learners using multimedia platforms.

Organization. The systematic arrangement and presentation of multimedia resources to ensure clarity and coherence in instruction.

Analytical. The learners' ability to evaluate, interpret, and make sense of scientific information through multimedia-based activities.

Expansive. The broadening of learners' understanding and creativity through exposure to diverse multimedia learning experiences.

Learning Competencies. Specific knowledge, skills, and attitudes that learners are expected to demonstrate after instruction, as outlined in the science curriculum standards.

CHAPTER 2

PRESENTATION, ANALYSIS OF DATA AND INTERPRETATION

This chapter presents, analyzes, and interprets the data obtained from the respondents, composed mainly of teachers and learners. It answers the questions posed in the problem. The study was divided into three parts. The first part of the chapter deals with related information as to teachers' age, gender, civil status, highest educational attainment, number of years in service, number of trainings, seminars, and workshops attended and the learners age and gender. The second part of the study deals with the extent of utilization of multimedia instructional tools, perception of multimedia integration and learners proficiency level in Science. The third part discusses the significant relationship between the extent of multimedia integration and the proficiency level of the learners.

RELEVANT INFORMATION

This initial section manages the respondents' important information of the teachers and learners of Bayongan Elementary School, San Miguel District of the Division of Bohol.

Teachers

This section pertains to the relevant information of Science teacher respondents in terms of age, gender, civil status, highest educational attainment, number of years in the service, seminars and workshops attended.

Age

Understanding the teachers' age is important as it may influence their adaptability and openness to integrating multimedia tools in teaching. Table 2 presents the distribution of the teacher-respondents in terms of age.

Table 2. Age Profile of the Teachers

Variable	Teachers	
	F	Percentage
51-60 years old	1	10
41-50 years old	5	50
31-40 years old	2	20
21-30 years old	2	20
Total	**10**	**100**
Mean	**40.5**	
SD	**9.72**	

Table 2 presents the age profile of the teachers. The data reveal that the majority of the respondents (50%) are within the age range of 41–50 years old, indicating that most teachers are in their mid-career stage. Meanwhile, 20% of the teachers fall within the 31–40 years old bracket, and another 20% are 21–30 years old, representing the younger group of educators who may have more recent exposure to digital technologies. Only 10% of the respondents belong to the 51–60 years old category, reflecting a smaller proportion of teachers nearing retirement age.

The computed mean age of 40.5 years suggests that, on average, the teachers are in their early forties, while the standard deviation of 9.72 indicates a moderate variation in age distribution among the respondents. This implies a fairly balanced mix of younger and older teachers, which can be beneficial in terms of sharing experiences and technological skills.

Overall, the results suggest that the teaching workforce in this study is composed primarily of mid-aged educators who are likely to possess both substantial teaching experience and a reasonable level of adaptability to multimedia integration in instruction.

Teachers' use of multimedia might be greatly impacted by their age. Research shows that younger teachers are frequently more adept and self-assured when utilizing technology than their older counterparts. Ibrahimi et al. (2024), for example, discovered that younger Albanian science instructors felt more at ease using ICT and multimedia in their instruction plans.

Gender

Examining gender differences is significant to identify varying perspectives and approaches toward multimedia integration in instruction. Table 3 shows the gender breakdown of respondents who are teachers.

Table 3 presents the gender distribution of the teachers. As shown, the majority of the respondents are female, comprising 80% of the total, while only 20% are male. This indicates a clear predominance of female teachers in the group, which reflects the general trend in the teaching profession, particularly in basic education, where women typically outnumber men.

Table 3. Gender Profile of the Teachers

Variable	Frequency	Percentage
Male	2	20
Female	8	80
Total	**10**	**100**

The results suggest that teaching continues to be a female-dominated profession, consistent with national and global statistics on the education workforce. This gender distribution may have implications for multimedia integration, as previous studies have noted that gender can influence preferences, confidence, and attitudes toward the use of technology in instruction.

Overall, the data imply that the teachers involved in this study are predominantly female, whose participation and perspectives play a crucial role in shaping effective multimedia integration practices in the classroom.

Alnahdi and Schwab (2023) found that students had a higher positive opinion of female professors' teaching methods and attitudes. According to a study by Hwang and Fitzpatrick (2021), female teachers in elementary and secondary education are more successful than their male colleagues at increasing student achievement for both genders.

Civil Status

Considering civil status is essential as personal circumstances may affect teachers' time, motivation, and engagement in multimedia-based instruction. In terms of their civil status, the profile of the teacher responders is shown in Table 4.

Table 4. Civil Status of the Teachers

Variable	Frequency	Percentage
Single	3	30
Married	7	70
Total	**10**	**100**

Table 4 shows the civil status of the teacher respondents. The data reveal that the majority of the teachers, or 70%, are married, while 30% are single. This indicates that most of the respondents are in a more settled stage of life, likely balancing family responsibilities with their professional duties.

The predominance of married teachers may suggest a level of maturity, stability, and professional commitment that can positively influence their approach to teaching and technology use. However, personal and familial responsibilities may also affect the amount of time and flexibility they have to explore new instructional innovations such as multimedia integration.

Overall, the findings suggest that the teaching population in this study is largely composed of married individuals who may demonstrate both experience and responsibility in their instructional practices, potentially impacting their engagement with multimedia tools in education.

Fatima Islahi and Nasrin (2019) found in their study of 482 secondary-school teachers in India that variables such as training, location of schools, medium of instruction *and* marital status were considered when examining attitudes toward information technology; however, they report that for marital status (as well as other background factors) no statistically significant gender-based differences in attitude were found.

Highest Educational Attainment

Teachers' educational attainment is a key factor that may determine their competence and confidence in utilizing multimedia for instructional purposes. Table 5 presents the profile of the respondents based on their greatest degree of schooling.

Table 5. Highest Educational Attainment of the Teachers

Variable	Frequency	1Percentage
Full – fledged master's degree of Education	1	10
With Certificate of Academic Requirements of Education	2	20
With 15 units in master's degree of Education	3	30
Bachelor's Degree (BSED/BEED)	5	50
Total	**10**	**100**

Table 5 presents the highest educational attainment of the teacher respondents. The data show that half of the teachers (50%) hold a bachelor's degree (BSED/BEED), while 30% have earned 15 units in a master's degree in education. Meanwhile, 20% of the teachers have completed the Certificate of Academic Requirements (CAR) for a master's degree, and only 10% are full-fledged master's degree holders.

These findings indicate that while most teachers have attained at least an undergraduate degree, a considerable number are pursuing or have partially completed graduate studies. This suggests a commitment to professional growth and continuous learning, which is vital in improving instructional competence and openness to innovations such as multimedia integration.

The predominance of teachers with undergraduate qualifications implies a developing potential for further academic advancement. Those with higher educational attainment are likely to possess a deeper understanding of pedagogical approaches and may demonstrate greater confidence in utilizing multimedia tools for effective teaching and learning.

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 the Service

The number of years in service is vital to understand how teaching experience contributes to the effective use of multimedia technologies in the classroom. The number of years in service is displayed in Table 6.

Table 6. Number of Years in Service of the Teachers

Variable	Frequency	Percentage
16 – 20 yrs.	3	30
11 – 15 yrs.	3	30
6 – 10 yrs.	2	20
1-5 yrs.	2	20
Total	**10**	**100**
Mean	**11.5**	
SD	**5.8**	

Table 6 presents the data on the number of years in service of the teacher respondents. The results show that 30% of the teachers have been in service for 16–20 years, while another 30% have served for 11–15 years. Meanwhile, 20% of the teachers have 6–10 years of experience, and another 20% have 1–5 years of teaching experience. The computed mean of 11.5 years indicates that, on average, the teachers have more than a decade of teaching experience, while the standard deviation of 5.8 reflects a moderate variation in their years of service.

These findings imply that the group is composed largely of experienced teachers who have developed substantial classroom expertise and pedagogical skills. Teachers with longer service may have more established teaching practices, while those with fewer years of experience may bring more familiarity with recent technological advancements. This combination of experienced and relatively new educators creates a balanced teaching environment that can foster the sharing of best practices and innovative approaches to instruction.

Overall, the data suggest that the teachers' years of service position them well for meaningful multimedia integration, as they possess both practical teaching experience and the potential to adapt to evolving educational technologies.

A study by Laabidi (2022) discovered that teachers' usage of multimedia in their teaching procedures was highly influenced by their age and teaching experience. In a similar vein, Magallanes et al. (2024) found that teacher opinions of the advantages of multimedia are greatly influenced by teaching experience.

Relevant Trainings and Seminar Attended

Participation in seminars, trainings, and workshops is crucial in enhancing teachers' skills and knowledge in multimedia integration. Table 7 presents the distribution of teachers according to the level of trainings, seminars, and workshops they have attended.

Table 7. Trainings, Seminars, and Workshop Attended

Variable	Frequency	Percentage
International	1	10
National	2	20
Regional	2	20
Division	4	40
School	1	10
Total	**10**	**100**

The data show that the majority of the teachers, or 40%, have participated in division-level professional development activities. Meanwhile, 20% have attended regional seminars, and another 20% have joined national trainings. Only 10% of the respondents have attended international events, and another 10% have participated in school-based trainings.

These findings indicate that most teachers have had access to professional development opportunities primarily within the division level, which suggests active participation in locally organized capacity-building programs. However, the smaller proportion of teachers who have attended national and international trainings highlights the need for broader exposure to more advanced and innovative practices, particularly in the field of multimedia integration.

Overall, the data suggest that while teachers are generally engaged in professional development, expanding opportunities for participation in higher-level trainings could further enhance their skills, confidence, and effectiveness in integrating multimedia tools into their teaching practices.

The Department of Education ensures that educators have undergone contemporary training and have up-to-date knowledge and abilities, which are thought to be beneficial and efficient in fostering learning and guaranteeing high-quality education. To help teachers improve their teaching abilities and find new ways to make learning enjoyable and productive, seminars and training sessions were organized. Additionally, Tapan et al. (2021) came to the conclusion that teachers must have top-notch training in order to guarantee the quality of instruction and enable students to gain the knowledge and skills necessary to become fully realized humans.

Learners

This section pertains to the relevant information of learners age and gender.

Age

The pupils' ages are a significant factor that must be considered in order to assess their degree of maturity and preparation for the session. Table 8 shows the summary of the learner's respondent's age.

Table 8. Age Profile of the Learners

Variable	Frequency	Percentage
11 years old	22	37
10 years old	38	63
Total	**60**	**100**

From table 8, thirty-eight (38) or 63 percent of the learners were 10 years old, while twenty-two (22) or 37 percent were 11 years old. Students under 10–11 years. old belong to the middle and late childhood.

Abdulrahaman et al. (2020) found that many multimedia-based teaching tools targeted students younger than 15 years old, noting that these younger age groups were under-researched but appeared to respond positively to multimedia interventions.

Gender

Table 9 indicates the distribution of learners' gender. Based on the result, thirty-two (32), or 53 percent, of the total respondents were female and twenty-eight (28) or 47 percent are males.

Table 9. Gender Profile of the Learners

Variable	Frequency	Percentage
Male	28	47
Female	32	53
Total	**60**	**100**

According to Andrews et al. (2022) said that gender disparities in education: when it comes to individual academic success, female often outperform males. In addition, girls score better in reading and writing than boys do in math and science. Male and female characteristics are more similar than different, even though these distinctions are occasionally negligible. The gender differences in academic attainment and performance are probably due, at least in part, to differences in gender-specific self-efficacy, interest, motivation, and assumptions.

MULTIMEDIA INSTRUCTIONAL TOOLS

The second part of the study deals with the multimedia instructional tools in terms of text, graphic tools, audio tools, video and interactive media tools.

Text

The use of text in multimedia integration is significant as it forms the foundation for presenting clear, structured, and meaningful instructional content. Table 10 presents the extent of teachers' multimedia integration in instruction in terms of text-based tools.

Table 10. Text

Indicators	WM	SD	Interpretation
1. Creating science activity sheets, lesson plans, or pupil worksheets.	3.90	0.281	Great Extent
2. Keeping track of science articles or online learning materials.	3.30	0.288	Moderate Extent
3. Organizing pupils' written outputs, reflections, or science journals.	3.60	0.277	Great Extent
4. Checking grammar and improving the clarity of science-related writing.	3.20	0.295	Moderate Extent
5. Formatting science fair reports or project write-ups neatly.	3.80	0.278	Great Extent
Average Mean	**3.56**	**0.284**	**Great Extent**

Legend
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 results reveal an average weighted mean of 3.56 with a standard deviation of 0.284, which is interpreted as "Great Extent." This indicates that teachers make substantial use of text-related multimedia tools in their science instruction.

Among the indicators, the highest mean score (WM = 3.90) was obtained for "Creating science activity sheets, lesson plans, or pupil worksheets," suggesting that teachers frequently employ text in preparing instructional materials. This is followed by "Formatting science fair reports or project write-ups neatly" (WM = 3.80) and "Organizing pupils' written outputs, reflections, or science journals" (WM = 3.60)—both of which indicate strong integration of textual elements in supporting students' written communication and organization skills.

Meanwhile, the indicators "Keeping track of science articles or online learning materials" (WM = 3.30) and "Checking grammar and improving the clarity of science-related writing" (WM = 3.20) obtained lower weighted means, interpreted as "Moderate Extent." These findings suggest that while teachers regularly use text-based tools for instructional purposes, their use for managing online resources or refining students' written outputs is comparatively less frequent.

Overall, the results imply that teachers demonstrate a strong level of text integration in multimedia-based instruction, particularly in preparing and organizing learning materials. This highlights the importance of textual tools in enhancing clarity, structure, and accessibility of science instruction.

Written materials (texts, readings, handouts) remain essential because they provide precise, persistent representations of content that students can re-visit, annotate, and use to scaffold self-regulated learning; Wentao Meng et al. (2024) note that well-designed text resources are a core element of effective online/blended learning ecosystems and that text combined with supportive instructional design helps learners manage cognitive load and access learning anytime.

Graphic Tools

Incorporating graphic tools is important because visual elements can enhance comprehension and retention of information among learners. Table 11 presents the extent of teachers' multimedia integration in instruction in terms of graphic tools.

Table 11. Graphic Tools

Indicators	WM	SD	Interpretation
1. Making colorful posters or visual aids about science topics (e.g., the solar system, ecosystems)	3.90	0.281	Great Extent
2. Creating simple charts or graphs from science experiment results.	3.90	0.281	Great Extent
3. Showing visual summaries of class data, such as plant growth charts or survey results.	4.00	0.286	Great Extent
4. Preparing clear graphs to explain results from science experiments.	4.00	0.286	Great Extent
5. Creating concept maps (e.g., parts of a plant, stages of matter).	4.10	0.293	Great Extent
Average Mean	**3.98**	**0.286**	**Great Extent**

The results show an average weighted mean of 3.98 with a standard deviation of 0.286, which is interpreted as "Great Extent." This indicates that teachers frequently utilize graphic tools in their science instruction to enhance visual learning and student engagement.

Among the indicators, the highest mean score (WM = 4.10) was obtained for "Creating concept maps (e.g., parts of a plant, stages of matter)," showing that teachers greatly use visual representations to simplify complex concepts and support knowledge organization. This is followed by "Preparing clear graphs to explain results from science experiments" and "Showing visual summaries of class data"—both with a weighted mean of 4.00, interpreted as "Great Extent." These findings emphasize teachers' active use of visual tools to present scientific data and aid comprehension.

Meanwhile, "Making colorful posters or visual aids about science topics" and "Creating simple charts or graphs from science experiment results," both with a mean of 3.90, also fall under "Great Extent." These results suggest consistent use of graphic elements in designing visually appealing and informative instructional materials.

Overall, the findings imply that teachers strongly integrate graphic tools into their instructional practices. This demonstrates their recognition of the importance of visuals in supporting students' understanding of abstract scientific concepts, fostering engagement, and enhancing retention of learning materials.

Graphic organizers, diagrams, and other visual tools help learners externalize structure, see relationships, and organize complex information; S. Prasansaph (2024) reports experimental evidence that combining task-based instruction with graphic organizers improves reading/writing competence and supports clearer mental organization of ideas, which enhances comprehension and performance.

Audio Tools

The integration of audio tools is valuable as sound and narration enrich the learning experience and support auditory learners. Table 12 presents the extent of teachers' multimedia integration in instruction in terms of audio tools.

Table 12. Audio Tools

Indicators	WM	SD	Interpretation
1. Recording science discussions or pupils' oral reports.	4.60	0.345	Very Great Extent
2. Creating background music or narration in science presentations.	3.80	0.278	Great Extent
3. Uploading or sharing recorded science lessons or songs about science topics.	3.90	0.281	Great Extent
Average Mean	**4.10**	**0.302**	**Great Extent**

The results reveal an average weighted mean of 4.10 with a standard deviation of 0.302, which is interpreted as "Great Extent." This indicates that teachers make considerable use of audio-based multimedia tools to enrich science instruction and engage auditory learners.

Among the indicators, the highest mean score (WM = 4.60) was obtained for "Recording science discussions or pupils' oral reports," interpreted as "Very Great Extent." This suggests that teachers frequently utilize audio recordings as a means of documentation, reflection, and reinforcement of learning. Following this, "Uploading or sharing recorded science lessons or songs about science topics" (WM = 3.90) and "Creating background music or narration in science presentations" (WM = 3.80) were both rated to a great extent, showing teachers' active use of sound elements to make science lessons more engaging and interactive.

Overall, the findings indicate that teachers demonstrate a strong level of integration of audio tools in their instructional practices. This reflects an awareness of the importance of sound, speech, and music in enhancing learners' comprehension, maintaining attention, and creating a more dynamic multimedia learning environment.

Audio media (podcasts, narrated lessons, audio feedback) increase accessibility and flexibility, support auditory/verbal learning channels, and foster reflection and peer connection; Hernandez-Lopez and Mendoza-Jimenez (2025) show that student-created podcasts can deepen subject understanding, strengthen community among learners, and provide a portable medium for rehearsal and metacognitive reflection.

Video

Utilizing video materials is essential for creating engaging and dynamic lessons that stimulate students' interest and understanding. Table 13 presents the extent of teachers' multimedia integration in instruction in terms of video tools.

Table 13. Video

Indicators	WM	SD	Interpretation
1. Making short science explainer videos	3.80	0.278	Great Extent
2. Showing educational science videos to enhance lessons.	3.90	0.281	Great Extent
3. Allowing students to create science videos or digital presentations	3.30	0.288	Moderate Extent
4. Reviewing and analyzing recorded science teaching sessions.	3.90	0.281	Great Extent
Average Mean	**3.73**	**0.282**	**Great Extent**

The results show an average weighted mean of 3.73 with a standard deviation of 0.282, interpreted as "Great Extent." This indicates that teachers make frequent use of video-based multimedia resources to support and enrich their science teaching.

Among the indicators, the highest mean scores were obtained for "Showing educational science videos to enhance lessons" and "Reviewing and analyzing recorded science teaching sessions," both with a weighted mean of 3.90, interpreted as "Great Extent." These results suggest that teachers often use video materials to supplement classroom discussions and for professional reflection and improvement of teaching practices.

The indicator "Making short science explainer videos" (WM = 3.80) was also rated to a great extent, indicating that teachers actively produce instructional videos to simplify complex scientific concepts. However, the item "Allowing students to create science videos or digital presentations" received the lowest mean score (WM = 3.30), interpreted as "Moderate Extent." This suggests that while teachers use videos frequently, student involvement in video production remains less emphasized.

Overall, the findings imply that teachers effectively integrate video tools as an instructional aid to enhance understanding and engagement in science learning. However, greater emphasis on student-created video outputs could further promote creativity, collaboration, and deeper learning experiences.

Instructional video is a powerful multimodal tool that can raise comprehension and retention when used appropriately (chunked, guided, and active); Dipon and Dio's 2024 meta-analysis found large positive effects of video-based instruction on academic performance in science and mathematics, highlighting video's capacity to model processes, animate abstract concepts, and support varied learning paces.

Interactive Media Tools

The use of interactive media is highly significant as it promotes active learning, collaboration, and student engagement in the instructional process. Table 14 presents the extent of teachers' multimedia integration in instruction in terms of interactive media tools.

Table 14. Interactive Media Tools

Indicators	WM	SD	Interpretation
1. Conducting quick science quizzes or class surveys online.	3.60	0.277	Great Extent
2. Using offline video simulation to enhance learning.	3.50	0.279	Great Extent
3. Using online virtual reality video in classroom instruction.	3.50	0.279	Great Extent
4. Conduct interactive science reviews and quizzes.	3.80	0.278	Great Extent
Average Mean	**3.60**	**0.278**	**Great Extent**

The results show an average weighted mean of 3.60 with a standard deviation of 0.278, interpreted as "Great Extent." This indicates that teachers regularly use interactive media to promote engagement and active participation in science instruction.

Among the indicators, the highest mean score (WM = 3.80) was recorded for "Conduct interactive science reviews and quizzes," suggesting that teachers frequently employ interactive platforms or applications to assess and reinforce students' understanding in a dynamic manner. Meanwhile, "Conducting quick science quizzes or class surveys online" (WM = 3.60) also received a rating of "Great Extent," reflecting teachers' integration of online tools to facilitate immediate feedback and learner interaction.

The indicators "Using offline video simulation to enhance learning" and "Using online virtual reality video in classroom instruction" both obtained a weighted mean of 3.50, interpreted as "Great Extent." These results indicate that teachers recognize the value of immersive and technology-enhanced learning environments, although the application of advanced tools like virtual reality may still be developing.

Overall, the findings reveal that teachers integrate interactive media tools to a great extent in their instructional practices, demonstrating a proactive approach to creating engaging, participatory, and technology-rich science learning experiences.

Interactive apps and platforms (student response systems, gamified quizzes, simulation apps) boost engagement, provide immediate feedback, and support formative assessment and active learning; Martín-Sómer et al. (2024) report that using multiple interactive applications increased student participation and was associated with improved academic outcomes, reflecting interactive media's strength for motivation and real-time formative checks.

Summary of Multimedia Instructional Tool

Table 15 presents the overall extent of teachers' utilization of various multimedia instructional tools.

Table 15. Summary of Multimedia Instructional Tool

Indicators	WM	SD	Interpretation
1. Text	3.56	0.284	Great Extent
2. Graphic Tools	3.98	0.286	Great Extent
3. Audio Tools	4.10	0.302	Great Extent
4. Video Tools	3.73	0.282	Great Extent
5. Interactive Media Tools	3.60	0.278	Great Extent
Average Mean	**3.79**	**0.286**	**Great Extent**

The results show an average weighted mean of 3.79 with a standard deviation of 0.286, which is interpreted as "Great Extent." This indicates that teachers actively and consistently integrate different forms of multimedia in their instructional practices, particularly in teaching science.

Among the multimedia components, audio tools obtained the highest weighted mean (WM = 4.10), interpreted as "Great Extent." This suggests that teachers frequently use audio recordings, narration, and sound-based materials to enhance students' understanding and engagement. Graphic tools ranked second (WM = 3.98), reflecting teachers' strong preference for visual aids such as posters, charts, and concept maps in simplifying complex topics.

Video tools (WM = 3.73), interactive media tools (WM = 3.60), and text-based tools (WM = 3.56)**—all interpreted as "Great Extent"—**demonstrate that teachers are integrating a wide range of multimedia elements to enrich instruction. Although audio and graphic tools are more frequently utilized, the consistent ratings across all components highlight teachers' recognition of the pedagogical value of multimedia in fostering effective and engaging science learning.

Overall, the findings suggest that teachers exhibit a high level of multimedia integration in instruction. This reflects a positive attitude toward the use of technology in education and indicates their readiness to adopt innovative tools that enhance teaching effectiveness and support diverse learning styles.

PERCEPTION OF MULTIMEDIA INTEGRATION

This part of the study deals with the teachers' perception of multimedia integration in terms of instructional, communication, organization, analytical and expansive.

Instructional

Teachers' perception of multimedia as an instructional tool is important to understand its role in improving teaching effectiveness and student learning outcomes. Table 16 presents the teachers' perception of multimedia integration in terms of its instructional aspect.

Table 16. Instructional

Indicators	WM	SD	Interpretation
1. Using educational sites enhances my lesson preparation and helps make learning more engaging.	4.10	0.293	Agree
2. Tutorials for self-training are valuable in improving my computer skills and instructional competence.	3.90	0.281	Agree
3. Online tutorials for remediation are effective tools to support students who need additional help in class.	3.90	0.281	Agree
Average Mean	**3.97**	**0.285**	**Agree**

Legend
4.21- 5.00 Strongly Agree 2.61-3.40 Neutral 1.00-1.80 Strongly Disagree
3.41- 4.20 Agree 1.81-2.60 Disagree

The results show an average weighted mean of 3.97 with a standard deviation of 0.285, interpreted as "Agree." This indicates that teachers generally acknowledge the positive impact of multimedia tools on enhancing lesson preparation, teaching effectiveness, and student learning engagement.

Among the indicators, the highest weighted mean ($WM = 4.10$) was obtained for "Using educational sites enhances my lesson preparation and helps make learning more engaging," suggesting that teachers recognize the value of online resources in enriching instructional content and motivating learners. The indicators "Tutorials for self-training are valuable in improving my computer skills and instructional competence" and "Online tutorials for remediation are effective tools to support students who need additional help in class" both received a weighted mean of 3.90, also interpreted as "Agree." These results imply that teachers view multimedia platforms as effective tools for professional growth and differentiated instruction.

Overall, the findings suggest that teachers perceive multimedia integration as a valuable instructional approach that enhances lesson design, supports student learning, and improves their own technological proficiency. This positive perception reflects teachers' readiness to adopt multimedia strategies to promote more interactive and effective classroom instruction.

Multimedia supports instructional effectiveness by engaging students through multi-sensory formats, aligning with the cognitive theory of multimedia learning's dual channels and active processing principles (Vázquez-Cano et al., 2022). For example, in a systematic review, Vázquez-Cano et al. found multimedia integration improved student participation, motivation and skill development across disciplines. Thus, multimedia fosters richer instructional delivery aligned with learners' cognitive and motivational needs.

Communication

Recognizing multimedia's role in communication is significant as it enhances interaction and information exchange between teachers and students. Table 17 presents the teachers' perception of multimedia integration in terms of its communication aspect.

Table 17. Communication

Indicators	WM	SD	Interpretation
1. E-mail is an effective means of communicating with my students.	3.40	0.283	Neutral
2. E-mail also strengthens my communication with parents and keeps them informed about their children's progress.	3.20	0.295	Neutral
3. Using an LCD projector or digital laboratory enriches classroom presentations and student understanding.	4.30	0.310	Strongly Agree
4. Creating PowerPoint presentations helps organize and present lessons clearly and attractively.	4.30	0.310	Strongly Agree
Average Mean	**3.80**	**0.300**	**Agree**

The results show an average weighted mean of 3.80 with a standard deviation of 0.300, which is interpreted as "Agree." This indicates that teachers generally recognize the role of multimedia tools in enhancing communication and information exchange within the teaching and learning process.

Among the indicators, the highest weighted means (WM = 4.30) were recorded for "Using an LCD projector or digital laboratory enriches classroom presentations and student understanding" and "Creating PowerPoint presentations helps organize and present lessons clearly and attractively," both interpreted as "Strongly Agree." These results suggest that teachers highly value the communicative potential of visual and digital tools in making lessons more engaging and comprehensible.

On the other hand, "E-mail is an effective means of communicating with my students" (WM = 3.40) and "E-mail also strengthens my communication with parents and keeps them informed about their children's progress" (WM = 3.20) were rated "Neutral." This implies that while teachers acknowledge the usefulness of e-mail as a communication tool, it may not be their primary or preferred method for interaction with students and parents, possibly due to accessibility or usage habits.

Overall, the findings indicate that teachers perceive multimedia, particularly visual presentation tools, as highly effective in enhancing instructional communication and promoting clarity in lesson delivery. However, there remains room for improvement in utilizing digital communication platforms to strengthen collaboration and feedback among teachers, students, and parents.

Multimedia enhances communication by providing diverse channels (visual, auditory, textual) that support more inclusive and interactive teacher-student dialogue and peer interaction. Huang and Hung (2022) demonstrated that integrating audio-video mediums boosted self-efficacy and identification in an organizational training context, which parallels how teacher-learner communication can be amplified in educational settings.

Organization

Perceptions on multimedia's organizational benefits are important as they relate to teachers' ability to structure, manage, and deliver lessons efficiently. Table 18 presents the teachers' perception of multimedia integration in terms of its organizational aspect.

Table 18. Organization

Indicators	WM	SD	Interpretation
1. Managing my laboratory schedules and materials online helps me stay organized and efficient.	3.80	0.278	Agree
2. Preparing handouts, tests, and assignments through multimedia improves lesson delivery and classroom	4.00	0.286	Agree

management.			
3. Searching the internet for lesson-related information enhances my content knowledge and teaching preparation.	4.20	0.301	Agree
Average Mean	**4.00**	**0.288**	**Agree**

The results show an average weighted mean of 4.00 with a standard deviation of 0.288, which is interpreted as "Agree." This indicates that teachers generally perceive multimedia tools as valuable aids in improving their organization, efficiency, and classroom management.

Among the indicators, the highest weighted mean ($WM = 4.20$) was obtained for "Searching the internet for lesson-related information enhances my content knowledge and teaching preparation," suggesting that teachers widely acknowledge the importance of online resources in enriching their instructional planning and ensuring lesson relevance. The indicator "Preparing handouts, tests, and assignments through multimedia improves lesson delivery and classroom management" followed with a mean of 4.00, indicating that teachers recognize the benefits of using digital tools to streamline lesson organization and support student learning.

Meanwhile, "Managing my laboratory schedules and materials online helps me stay organized and efficient" received a weighted mean of 3.80, also interpreted as "Agree." This shows that teachers appreciate the usefulness of online systems and applications in managing instructional tasks and resources efficiently.

Overall, the findings suggest that teachers view multimedia integration as a key factor in enhancing organizational effectiveness, enabling them to plan, manage, and deliver lessons more systematically. This positive perception underscores multimedia's role not only in instruction but also in improving teachers' productivity and professional workflow.

On the organizational front, multimedia allows for more effective structuring, sequencing and pacing of content, facilitating better management of class structure and resources. Gallego II (2024) described how multimedia as a tool enables multi-modal presentation of material, which supports improved organization of learning experiences and helps learners process large amounts of information more systematically.

Analytical

Teachers' views on multimedia for analytical purposes are vital in assessing how technology fosters critical thinking and problem-solving skills among learners. Table 19 presents the teachers' perception of multimedia integration in terms of its analytical aspect.

Table 19. Analytical

Indicators	WM	SD	Interpretation
1. Creating charts or graphs using a computer improves data analysis and presentation in class.	4.30	0.310	Strongly Agree
2. Developing a class or school website provides an effective platform for sharing educational resources and student outputs.	4.10	0.293	Agree
3. Analyzing materials before laboratory exercises ensures that students gain meaningful and accurate learning experiences.	4.00	0.286	Agree
4. Using the internet for creating graphs and engaging in blogs promotes critical thinking and digital literacy.	4.30	0.310	Strongly Agree
Average Mean	**4.18**	**0.300**	**Agree**

The results show an average weighted mean of 4.18 with a standard deviation of 0.300, which is interpreted as "Agree." This indicates that teachers generally recognize the importance of multimedia tools in developing students' analytical skills, enhancing data interpretation, and promoting critical thinking in science instruction.

Among the indicators, the highest weighted means (WM = 4.30) were obtained for "Creating charts or graphs using a computer improves data analysis and presentation in class" and "Using the internet for creating graphs and engaging in blogs promotes critical thinking and digital literacy," both interpreted as "Strongly Agree." These findings suggest that teachers highly value the use of technology in processing and presenting data, as well as in fostering analytical and reflective thinking among students.

The indicators "Developing a class or school website provides an effective platform for sharing educational resources and student outputs" (WM = 4.10) and "Analyzing materials before laboratory exercises ensures that students gain meaningful and accurate learning experiences" (WM = 4.00)**—both interpreted as "Agree"—**show that teachers view multimedia as an effective tool not only for information dissemination but also for ensuring accurate and meaningful learning experiences.

Overall, the findings reveal that teachers perceive multimedia integration as instrumental in enhancing analytical and higher-order thinking skills. This positive perception reflects the teachers' understanding of multimedia's role in promoting inquiry-based learning, data-driven analysis, and digital literacy among students.

Multimedia integration supports analytical and higher-order thinking skills by enabling interactive simulations, branching visuals and representation of complex phenomena; this in turn promotes reflection and analysis. For instance, the review by Vázquez-Cano et al. (2022) found that students using interactive multimedia resources developed better problem-solving and organizing skills.

Expansive

Understanding teachers' perception of multimedia as an expansive tool is significant because it highlights its potential to extend learning beyond traditional classroom boundaries. Table 20 presents the teachers' perception of multimedia integration in terms of its expansive aspect.

Table 20. Expansive

Indicators	WM	SD	Interpretation
1. Conducting experiments or laboratory exercises with projected instructions facilitates better student engagement and understanding.	4.00	0.286	Agree
2. Using 3D software modeling or simulations enhances students' conceptual learning through visualization.	4.00	0.286	Agree
3. Word processors like Microsoft Word are essential tools for creating professional teaching and learning materials.	4.00	0.286	Agree
4. Utilizing the Audio-Visual Room (AVR) for lectures makes instruction more interactive and stimulating.	3.80	0.278	Agree
5. Maintaining an online journal or discussion board fosters reflection and continuous professional growth.	3.90	0.281	Agree
Average Mean	**3.94**	**0.284**	**Agree**

The results show an average weighted mean of 3.94 with a standard deviation of 0.284, which is interpreted as "Agree." This indicates that teachers generally recognize the capacity of multimedia tools to broaden learning opportunities, enhance instructional delivery, and promote professional growth.

All indicators under this category were interpreted as "Agree," demonstrating teachers' consistent appreciation of multimedia's expansive role in instruction. The indicators "Conducting experiments or laboratory exercises with projected instructions facilitates better student engagement and understanding," "Using 3D software modeling or simulations enhances students' conceptual learning through visualization," and "Word processors like Microsoft Word are essential tools for creating professional teaching and learning materials" all obtained a weighted mean of 4.00, highlighting teachers' acknowledgment of the value of technology in improving instructional clarity, visualization, and productivity.

Meanwhile, "Maintaining an online journal or discussion board fosters reflection and continuous professional growth" (WM = 3.90) and "Utilizing the Audio-Visual Room (AVR) for lectures makes instruction more interactive and stimulating" (WM = 3.80) also received positive ratings, indicating teachers' agreement that multimedia supports both reflective practice and interactive learning environments.

Overall, the findings suggest that teachers perceive multimedia integration as expansive, offering diverse avenues for instructional innovation, professional development, and learner engagement. This underscores multimedia's potential to extend traditional teaching practices toward more dynamic, technology-enhanced educational experiences.

Multimedia contributes to expansive learning by extending browsing, exploring, and creating beyond traditional boundaries—thus broadening the learning environment and fostering autonomy and lifelong learning. Gallego II (2024) pointed out that multimedia in classrooms supports multiple learning styles and serves as an instructional instrument that allows students to access, revisit, and engage with content in broader contexts, thereby expanding their educational world.

Summary of Perception of Multimedia Integration

Table 21 presents the summary of teachers' perception on the multimedia integration.

Table 21. **Summary of Perception of Multimedia Integration**

Indicators	WM	SD	Interpretation
1. Instructional	3.97	0.285	Agree
2. Communication	3.80	0.300	Agree
3. Organization	4.00	0.288	Agree
4. Analytical	4.18	0.300	Agree
5. Expansive	3.94	0.284	Agree
Average Mean	**3.99**	**0.291**	**Agree**

The results reveal an average weighted mean of 3.99 with a standard deviation of 0.291, which is interpreted as "Agree." This indicates that teachers generally hold a positive perception toward multimedia integration in education, recognizing its significant contribution to improving instructional delivery, enhancing student engagement, and supporting effective teaching and learning practices.

Among the dimensions, the highest rating was observed in the analytical aspect (WM = 4.18), suggesting that teachers highly value multimedia for its ability to promote critical thinking, data interpretation, and problem-solving in classroom settings. This was followed by the organizational aspect (WM = 4.00), emphasizing how multimedia tools assist teachers in efficiently managing instructional materials, schedules, and lesson resources.

The instructional (WM = 3.97) and expansive (WM = 3.94) aspects also received high agreement ratings, indicating that teachers view multimedia as an essential component in lesson preparation, conceptual visualization, and continuous professional growth. Meanwhile, the communication aspect (WM = 3.80) still showed a positive response, reflecting teachers' recognition of multimedia's role in enhancing classroom presentations and facilitating better communication among students, teachers, and parents.

Overall, the findings affirm that teachers perceive multimedia instructional tools as beneficial and relevant in modern teaching. Their agreement across all dimensions demonstrates a collective acknowledgment of multimedia as a powerful educational resource that enriches instruction, fosters interaction, enhances analytical learning, and supports both student engagement and teacher efficiency.

PROFICIENCY LEVEL IN SCIENCE

This part of the study deals with the proficiency level in Science 5 given the set of competencies. Table 22 presents the learners' performance in terms of the Most Essential Learning Competencies (MELCs) in science 5.

Table 22. Most Essential Competencies – Science 5

Competencies	Learners		
	WM	**SD**	**Interpretation**
identifying from pictures and labeled diagrams the parts of the digestive system as mouth, gullet, stomach, small intestine, and large intestine, and describe how they work,	3.45	0.281	Proficient
distinguish from pictures and diagrams the parts of the respiratory system such as the nose, windpipe, and lungs, and describe how they work, and	3.47	0.280	Proficient
discerning from pictures and labeled diagrams the parts of the female reproductive system as ovaries, uterus, and vagina and those of the male reproductive system as the prostate, testis, and penis and describe how they work	3.40	0.283	Proficient
Average Weighted Mean	**3.44**	**0.281**	**Proficient**

Legend

4.21- 5.00 Advance
2.61-3.40 Approaching Proficiency
1.00-1.80 Beginning
3.41- 4.20 Proficient
1.81-2.60 Developing

The results show an average weighted mean of 3.44 with a standard deviation of 0.281, interpreted as "Proficient." This indicates that, on average, the learners have demonstrated a solid understanding and consistent ability to meet the expected learning standards in the identified competencies for science 5.

Among the competencies, the highest weighted mean (WM = 3.47) was recorded in "distinguishing from pictures and diagrams the parts of the respiratory system such as the nose, windpipe, and lungs, and describing how they work," interpreted as "Proficient." This suggests that learners are more adept at recognizing and understanding the functions of the respiratory system compared to other systems discussed.

The competency "identifying from pictures and labeled diagrams the parts of the digestive system as mouth, gullet, stomach, small intestine, and large intestine, and describing how they work" also obtained a high weighted mean (WM = 3.45), showing learners' strong grasp of this fundamental topic. Meanwhile, the lowest mean (WM = 3.40) was in "discerning from pictures and labeled diagrams the parts of the female and male reproductive systems and describing how they work," though still within the "Proficient" level. This may indicate that while learners meet expectations, additional reinforcement may be needed to deepen their understanding of this particular system, possibly due to its complexity or sensitivity.

Overall, the findings suggest that learners are performing at a proficient level across all key science competencies. This implies that the integration of multimedia tools and visual learning materials may have positively contributed to learners' ability to identify, analyze, and describe the parts and functions of major organ systems effectively.

According to Nair (2024), by utilizing the tools and resources that technology provides, children can develop critical thinking, problem-solving, and collaborative abilities. Additionally, it exposes kids to a variety of digital tools and platforms, which helps them become proficient and confident users.

SIGNIFICANT RELATIONSHIP BETWEEN MULTIMEDIA INTEGRATION AND PROFICIENCY LEVEL IN SCIENCE

This section discusses significant relationships.

Table 23 presents the correlation analysis between the extent of multimedia integration and the proficiency level of the learners. The table specifically illustrates the strength and significance of the relationship using Pearson's r-value, p-value, and corresponding statistical decision and interpretation.

Table 23. Multimedia Integration and Proficiency Level in Science

Variables	r-value	p - value	Decision	Remarks
Multimedia Instructional Tools and Proficiency Level in Science	0.440	0.000435	Reject Ho	Significant
Perception of Multimedia Integration and Proficiency Level in Science	0.810	0.00001	Reject Ho	Significant

Table 23 presents the relationship between the use of multimedia instructional tools and students' proficiency level in science. The results reveal a correlation coefficient (r) of 0.440 with a p-value of 0.000435, indicating a moderate positive and significant relationship between multimedia instructional tools and proficiency level in science. This means that the greater the use of multimedia in instruction—such as videos, simulations, digital presentations, and interactive learning materials—the higher the students' proficiency in science tends to be. The significant p-value, which is lower than the 0.05 level of significance, leads to the rejection of the null hypothesis, affirming that multimedia tools indeed contribute positively to student learning outcomes in science.

Furthermore, the relationship between perception on multimedia integration and proficiency level in science shows an even stronger connection, with an r-value of 0.810 and a p-value of 0.00001. This result signifies a very strong positive and significant relationship, suggesting that teachers who have favorable perceptions toward the integration of multimedia in the classroom tend to achieve and facilitate higher levels of proficiency in science. When learners perceive multimedia-based instruction as engaging, useful, and effective, their motivation and comprehension improve significantly, leading to better academic performance.

The findings underscore the crucial role of multimedia in science education. The integration of technology-based tools not only enhances the teaching–learning process but also stimulates students' interest and understanding of complex scientific concepts. Positive perceptions toward multimedia further reinforce its effectiveness, as learners become more active participants in their own learning process. These results imply that Science educators should continue to incorporate and innovate with multimedia strategies to create dynamic, interactive, and effective learning environments that promote higher levels of proficiency among students.

ISSUES AND CONCERNS

This section deals with the issues and concerns encountered by the teachers in integrating multimedia in science teaching.

Table 24. Issues and Concerns of Integrating Multimedia in Science Teaching

Issues and Concerns	Rank
Some schools or students may lack the necessary devices or internet connection to use multimedia tools effectively.	1
Not all learners have equal access to digital tools outside the classroom, creating learning gaps.	2
Problems such as software errors, slow internet, or malfunctioning equipment can disrupt lessons.	3
Preparing and implementing multimedia-based lessons can be time-consuming for	4

teachers.	
Teachers may not have adequate skills or confidence to integrate multimedia resources in science instruction.	5
Poor or unstable internet access can hinder real-time multimedia instruction.	6
Regular updates, repairs, and software subscriptions may strain school resources.	7
Evaluating learning outcomes from multimedia activities can be difficult without proper assessment tools.	8
Some educators may be hesitant or unwilling to adopt new teaching methods involving technology.	9
Multimedia elements can divert learners' attention away from the main lesson objectives.	10

Integrating multimedia tools in science instruction presents several challenges that affect both teachers and learners. One major concern is the issue of access and equity, as not all schools and students have the necessary devices or stable internet connection to effectively use digital learning tools. Lack of necessary devices or internet connection.

Many schools and learners face infrastructural barriers such as insufficient devices or unreliable internet access, which directly limit the effective use of multimedia instructional tools; for example, Israel Kibirige (2023) reported that primary teachers of STEM subjects in Ugandan schools struggled to integrate ICT because of inadequate hardware and connectivity in the post-pandemic era.

The digital divide persists even when classrooms are digitally equipped, as some learners lack adequate tools or connectivity at home, thereby exacerbating learning disparities; in Spain, González-Benito et al. (2024) found that access to devices, internet, and digital skills remain structurally unequal, posing exclusion risks for students outside school hours.

Moreover, technical difficulties such as software errors, slow internet, and malfunctioning equipment often disrupt lessons and hinder the smooth flow of instruction. Teachers also face the challenge of preparing and implementing multimedia-based lessons, which can be time-consuming and demanding, especially when they are already managing heavy workloads. The study by Sherri N. Brackett (2024) found that teachers cited insufficient instructional planning time as a moderate barrier to technology integration in K-12 contexts.

Another critical issue is the limited digital competence of some teachers who may lack the skills or confidence to integrate multimedia resources effectively into their lessons. Edsyl Berongoy-Peñas and James L. Paglinawan (2025) in a phenomenological study identified low teacher digital-pedagogical skills and negative attitudes as key access-and-usage barriers in Philippine schools.

Poor or unstable internet connections further complicate real-time multimedia instruction, making it difficult to maintain interactive engagement. Muhammad Law et al. (2023) suggested that unstable or limited broadband severely affected digital teaching implementation across regions.

Additionally, the cost of maintaining, updating, and repairing digital tools, as well as purchasing software subscriptions, puts a strain on school resources. Kibirige (2023) noted that limited funding for ICT maintenance impeded the sustained use of multimedia tools in STEM instruction in Uganda.

Assessing students' learning outcomes through multimedia activities also poses challenges, particularly when appropriate evaluation tools are not available. the systematic review by Kabir (2020) pointed out that mismatches between technology-designed learning tasks and assessment systems are a barrier to effective integration.

Furthermore, some teachers remain resistant to adopting new technologies due to lack of familiarity or fear of change, which can slow down innovation in teaching methods. A s Sarlin et al. (2024) reported, teacher attitudes and resistance to change remain significant non-physical barriers to ICT integration in under-resourced schools.

Finally, while multimedia can make lessons engaging, it can also become a source of distraction if not used purposefully, diverting learners' attention from key lesson objectives. Overall, these challenges highlight the need for comprehensive teacher training, improved technological infrastructure, and thoughtful planning to ensure that multimedia integration truly enhances science teaching and learning. Fiona Martin et al. (2025) reviewed "digital distractions" in education and found that multimedia tools, if uncontrolled, can lead to off-task behaviour and decreased learning effectiveness.

CHAPTER 3

SUMMARY, FINDINGS, CONCLUSIONS AND RECOMMENDATIONS

This chapter dealt with the summary, findings, conclusions, and recommendations. The summary restates the major problems and sub problems of the study. The findings are based upon the gathered data; the conclusions were based upon the findings, and the recommendations were carefully taught out based upon the gathered data.

SUMMARY

This research assessed the extent of multimedia integration of science teachers of Bayongan Elementary School, San Miguel District of the Division of Bohol for the School Year 2025-2026.

The study was limited to the following areas of concern: related information of the teachers' age and gender, civil status, highest educational attainment, number of years in the service, related trainings, seminars, and workshops attended and learners' age and gender; extent of utilization of multimedia instructional tools in terms of text, graphic tools, audio tools, video, and interactive media tools and perception of multimedia integration in terms of instructional, communication, organization, analytical, and expansive. The researcher made use of the descriptive – correlational method of research with the use of adapted and modified questionnaire as the main tool in the gathering of relevant data.

FINDINGS

The following were the main findings.

The study involved the demographic and professional backgrounds of the teachers. Most of the teachers were between the ages of 41 to 50, female, married, bachelor's degree holder, 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 age of 10 years old and female.

The findings reveal that the use of multimedia instructional tools was implemented to a great extent. Among the different indicators, audio and graphic tools were the most utilized, indicating that teachers or learners frequently employed these media to enhance instruction and engagement. Text, video, and interactive media tools were also used to a great extent, reflecting a well-rounded integration of multimedia elements in the teaching process. Overall, the results suggest that multimedia tools play a significant role in enriching the learning experience and supporting effective instruction.

Moreover, the findings indicate that respondents have a positive perception of multimedia instructional tools. They generally agree that these tools are effective in supporting instructional delivery, enhancing communication, improving organization, and promoting analytical and expansive thinking. The highest agreement on the analytical aspect suggests that multimedia tools help learners better understand and evaluate information. Overall, the results imply that multimedia instructional tools are perceived as valuable components in the teaching and learning process.

The study found a substantial correlation between the extent of multimedia integration and the proficiency level of the learners in science. The issues and concern in multimedia integration in teaching science were the following: limited access to technology, insufficient teacher training, technical difficulties, time constraints, equity issues, maintenance and sustainability, inconsistent internet connectivity, teacher resistance to change, assessment challenges, and student distraction.

CONCLUSION

Based on the findings of the study, it can be concluded the extent of multimedia integration and the proficiency level of the learners in science have a significant relationship with each other.

RECOMMENDATION

The following recommendation was offered: Implementation of the multimedia digital training plan to be implemented in the next SY 2026-2027.

CHAPTER 4

OUTPUT OF THE STUDY

RATIONALE

In the ever-evolving landscape of education, the integration of multimedia instructional tools has become essential in enhancing teaching and learning processes. As technology continues to influence classroom instruction, teachers are challenged to utilize various multimedia tools, text, graphics, audio, video, and interactive media, to create engaging, learner-centered environments.

The results of the study on the extent of utilization and perception of multimedia integration reveal the need for continuous professional development in this area. Teachers must be equipped not only with technical skills but also with the pedagogical competence to effectively apply these tools for instructional, communicative, organizational, analytical, and expansive purposes.

This aims to strengthen educators' digital competencies by providing targeted training programs throughout the school year. Through this initiative, the school envisions empowering teachers to design, produce, and implement multimedia-enriched lessons that cater to diverse learners, foster creativity, and improve student outcomes. The plan also supports the Department of Education's thrust toward digital transformation and 21st-century learning readiness.

OBJECTIVES

This multimedia digital training plan will hopefully:

1. Enhance teachers' competence and confidence in utilizing multimedia instructional tools—including text, graphics, audio, video, and interactive media—for effective teaching and learning delivery.
2. Promote meaningful integration of multimedia instruction that supports students' communication, collaboration, critical thinking, and creativity in the digital classroom.
3. Develop a sustainable culture of digital innovation within the school by fostering continuous professional development, collaboration, and sharing of best practices among educators.

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 clientele of this multimedia digital training plan are the teachers of Bayongan Elementary School, San Miguel District of the Division of Bohol.

MULTIMEDIA DIGITAL TRAINING PLAN

Enclosure No. 4 to DepEd Memorandum No. ______ s. 2023)

Republic of the Philippines

Department of Education

National Educators Academy of the Philippines

Professional Development Program Design Form

INSTRUCTIONS: Provide the details in the designated spaces as Detailed *required. Indicate N/A if not applicable.* ***DO NOT ABBREVIATE.***

PROFESSIONAL DEVELOPMENT (PD) PROGRAM PROVIDER PROFILE

PD Program Owner	**Lydia B. Pesquira**				
Complete Office Address	Bayongan Elementary School, Bayongan, San Miguel, Bohol				
Office Telephone No.	0907 906 6380	Office Email Address	jonalyn.boncales@deped.gov.ph		
PD Program Manager	Rowena B. Lascoña	Email Address	09127350925tnt@gmail.com	Mobile No.	09482047212

PD PROGRAM PROFILE

Give an overview of your proposed PD program by providing the following details.

Title	***Innovative Science Instruction: Teacher Training on Effective Multimedia Use***
Rationale	The rapid advancement of digital technology has transformed the way instruction is delivered in the classroom. To ensure that teachers remain effective in facilitating learning in a multimedia-rich environment, it is vital to strengthen their competence in integrating various multimedia tools such as text, graphics, audio, video, and interactive media. Findings from the assessment of teachers' current utilization and perceptions of multimedia integration indicate a need for systematic professional development that builds both technical skills and pedagogical application. This training program aims to equip teachers with the necessary knowledge, strategies, and hands-on experience to design engaging, student-centered multimedia instructional materials. By enhancing their capabilities, the school moves toward creating dynamic learning environments that promote communication, critical thinking, creativity, and digital fluency among learners. The program also supports DepEd's direction toward digital innovation and 21st-century teaching excellence.
Program Description	The *Innovative Science Instruction: Teacher Training on Effective Multimedia Use* program is designed to strengthen teachers' capability to integrate multimedia tools into their daily instructional practices. As classrooms increasingly rely on digital resources and interactive learning environments, teachers must be equipped with the skills and confidence to effectively utilize various forms of multimedia such as text, graphics, audio, video, and interactive media. This training program responds directly to the identified needs of teachers, as revealed in the assessment of their current extent of multimedia utilization and perceptions of its role in instruction, communication, organization, analysis, and expansive learning. The program provides structured, hands-on training sessions that allow teachers to explore digital platforms, design multimedia-enhanced lessons, and apply strategies aligned with best practices in multimedia learning. Participants will receive guided instruction on creating visually appealing content, producing audio and video materials, and incorporating interactive tools that support student engagement and comprehension. Beyond developing technical skills, the program emphasizes pedagogical integration—ensuring that multimedia is used not merely as decoration but as a meaningful tool to deepen understanding, support inquiry-based learning, and improve the overall effectiveness of science instruction. Throughout the training, teachers will collaborate, share insights, and evaluate their outputs with the goal of applying these skills in real classroom settings. By the end of the program, participants are expected to produce complete multimedia instructional outputs and demonstrate improved confidence and proficiency in integrating digital tools into their teaching. Ultimately, this professional development

<table>
<tr><td></td><td colspan="3">initiative aims to cultivate innovative, digitally empowered educators capable of fostering enriched learning experiences for 21st-century learners.</td></tr>
<tr><td rowspan="4">Program Objectives</td><td colspan="3">Results objectives: As a results of the participants' improved competence and performance, the participants will be able to:
• Produce and implement multimedia-enhanced lessons that increase student engagement and learning performance.
• Demonstrate improved instructional delivery through the effective selection, design, and integration of multimedia tools across subject areas.</td></tr>
<tr><td colspan="3">Application objectives: Back in the workplace, the participants will be able to:
• Apply appropriate multimedia tools (text, graphics, audio, video, and interactive media) to lesson planning, classroom activities, and assessments.
• Utilize multimedia to support instructional, communication, organizational, analytical, and expansive functions in their teaching practice.</td></tr>
<tr><td colspan="3">Terminal objectives: By the end of the PD program, the participants will be able to:
• Create complete multimedia-based instructional materials aligned with curriculum standards.
• Integrate at least one multimedia strategy per lesson that enhances understanding, participation, and learner motivation.
• Evaluate the effectiveness of multimedia use in their classrooms and adjust strategies as needed.</td></tr>
<tr><td colspan="3">Enabling objectives: Specifically, the participants will be able to:
• Identify and differentiate the functions and pedagogical uses of various multimedia tools.
• Develop skills in using digital platforms such as Canva, Google Workspace, video editing software, audio editors, and interactive tools like Kahoot or Quizizz.
• Apply best practices in multimedia design (e.g., clarity, consistency, cognitive load reduction).
• Collaborate with peers in producing multimedia lesson outputs.
• Troubleshoot basic technical issues related to multimedia creation and presentation.</td></tr>
<tr><td rowspan="3">Target Professional Standard with specific Domain/s, Strand/s, and Indicator/s</td><td>Professional Standard</td><td colspan="2"></td></tr>
<tr><td>Domain/s</td><td>Strand/s</td><td>Indicator/s</td></tr>
<tr><td>• Curriculum and Planning

• Assessment and Reporting

• Personal Growth and Professional Development</td><td>4.5 Teaching and learning resources including ICT

5.1 Design, selection, organization and utilization of assessment strategies

7.4 Professional reflection and learning to improve practice</td><td>4.5.2 Select, develop, organize and use appropriate teaching and learning resources, including ICT to address learning goals
5.1.2 Design, select, organize and use diagnostic, formative and summative assessment strategies consistent with curriculum requirements
7.4.2 Developing personal improvement plan based on reflection of one's practice and ongoing professional learning</td></tr>
<tr><td rowspan="3">Target Participants</td><td colspan="3">Participants Profile:</td></tr>
<tr><td colspan="3">The target participants for this undertaking are the faculty members and school head of Mandaue City Science High School.</td></tr>
<tr><td colspan="3">Total number of target participants: 11 | Number of batches per implementation (if applicable): 1 | Number of participants per batch: 11 | Number of implementations: 1</td></tr>
<tr><td>Delivery Platform</td><td>In-Person</td><td>Indicative Dates of Implementation</td><td>SY 2026-2027</td></tr>
</table>

PD PROGRAM DESIGN

AREAS OF CONCERN	OBJECTIVES	STRATEGY	TIME FRAME	TARGET/OUTPUT INDICATOR	RESOURCES NEEDED	PERSON RESPONSIBLE	BUDGET REQUIREMENTS Amount	BUDGET REQUIREMENTS Source
Text-based Multimedia Tools	Enhance teachers' skills in creating and integrating text-based instructional materials (e.g., digital worksheets, e-books, captions).	Conduct hands-on workshop on digital text creation using Google Docs, Canva, and MS Publisher.	June–July 2026	90% of teachers able to produce digital text-based instructional materials.	Computers, Internet access, projector, training modules	ICT Coordinator, Subject Heads	₱45,000	MOOE/ School Funds/ PTA Funds

Graphic Tools	Develop proficiency in using graphic design tools for instructional purposes.	Training on Canva, Photoshop, and PowerPoint visual design techniques.	August–September 2026	Teachers produce at least one graphic-based instructional material.	Laptops, software licenses, internet	ICT Coordinator	₱30,000	MOOE/ School Funds/ PTA Funds
Audio Tools	Improve use of audio tools for lessons (e.g., podcasts, voiceovers, narration).	Conduct seminar-workshop on audio recording and editing using Audacity and mobile apps.	October 2026	80% of participants integrate audio materials into teaching.	Laptops, microphones, speakers	ICT Coordinator / English Dept. Head	₱20,000	MOOE/ School Funds/ PTA Funds
Video Tools	Strengthen teachers' ability to produce and edit instructional videos.	Training on basic video editing (CapCut, Filmora, Canva Video).	November 2026–December 2026	85% of teachers produce one short instructional video.	Laptops, smartphones, editing software	ICT Coordinator / Subject Heads	₱30,000	MOOE/ School Funds/ PTA Funds
Interactive Media Tools	Promote integration of interactive tools (Kahoot, Quizizz, Nearpod, Google Forms).	Conduct training on creating interactive assessments and lessons.	January–February 2027	Teachers implement at least one interactive activity per quarter.	Computers, internet, mobile devices	ICT Coordinator / Master Teachers	₱20,000	MOOE/ School Funds/ PTA Funds
Instructional and Analytical Integration	Strengthen understanding of multimedia as a tool for instructional delivery and learner analysis.	Conduct professional learning community (PLC) sessions and sharing of best practices.	March 2026	Teachers demonstrate improved multimedia integration in lesson plans.	Training materials, projector	School Head / ICT Coordinator	₱15,000	MOOE/ School Funds/ PTA Funds
Communication, Organizational, and Expansive Use	Improve communication and collaboration through multimedia (e.g., online announcements, digital portfolios).	Conduct seminar on using Google Workspace, MS Teams, and Canva for Education.	April 2026	Teachers and students use multimedia tools for communication and presentations.	Internet, devices, software access	ICT Coordinator / School Head	₱15,000	MOOE/ School Funds/ PTA Funds

Declaration:

I hereby declare the information provided in this application is true and correct and there have been no misleading statements, omission of any relevant facts nor any misinterpretation made.

I agree that the DepEd-National Educators Academy of the Philippines to be the co-owner of all the data gathered and the copyright of any publication of the use of these data.

To be signed by the PD Program Manager

Program Manager	**ROWENA BALIAR LASCOÑA**
Signature	
Date	November 16, 2025

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