

The Motivational Practices of Junior Science Teachers in Empowering Learners: Basis for Strategic Teaching Framework

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Abstract: This study aimed to investigate the motivational practices employed by junior high school science teachers in motivating learners and its effectiveness in all secondary schools, both public and private, within the Juban District, Juban, Sorsogon. Given the different motivational practices applied by junior science teachers, the study sought on how junior high school learners assess the motivational practices employed by junior science teachers and determine the challenges encountered by junior science teachers in motivating learners. The researcher also proposed and developed strategic teaching framework along with the proposed innovative teaching practices, which might be implemented and utilize by junior science teachers in Juban District and beyond, promoting for an effective, positive, and productive learning environment.

The study employed descriptive research design with mixed method, both qualitative and quantitative approaches. A total of twenty-five (25) secondary school science teachers participated and sixty (60) randomly selected junior science learners within the Juban District. Data gathering involves checklist and survey-questionnaire that measured the motivational practices employed by junior science teachers, its effectiveness, and the challenges encountered by junior science teachers in motivating learners. Structured interview was also used to determine how the learners assessed the different motivational practices utilized in teaching by junior science teachers. The gathered data were analyzed and interpreted in tables with sums of ranks, ranks, weighted mean and description, and descriptive analysis. For the results of structured interview, the researcher used thematic paragraphs. The results of this study also supported by existing related studies and literature.

Findings revealed that technology integration such as simulations and videos is ranked 1st motivational practice employed by junior high school science teachers in motivating learners with sums of ranks of 39. Teachers were found effectively utilized the different motivational practices they employed with average mean of 4.28. Junior high school learners assessed the effectiveness of the different motivational practices and the results found out that providing varied learning tasks leads to increase the curiosity and engagement of learners, recognized its relevance to everyday life, improved academic performance, accepted criticisms from science teachers constructively, and mastery of science concepts into practical hands-on skills.

The results suggested that technology integration be strengthened in science classes, sustain the motivational practices employed by junior science teachers, recognize the importance of learners' participation in assessing the effectiveness of the different motivational practices employed by junior science teachers, providing seminars, workshops, and trainings including wellness break for the teachers and students, and innovative teaching practices with strategic teaching framework be implemented and monitored.

Keywords: *Motivational Practices, Strategic Teaching Framework, Innovative Teaching Practices, Technology Integration, Empowering Learners, Varied Learning Tasks, Effectiveness, Junior High School Learners, Effective, Positive, and Productive Learning Environment.*

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I. INTRODUCTION

The 21st century presents remarkable challenges and opportunities, demanding a workforce equipped with critical and creative thinking skills, adaptability, and a lifelong passion to learning. In this dynamically transforming landscape, the traditional models of education are being re-evaluated to better prepare learners for success. Fundamental to this transformation lies the imperative to empower and motivate learners, enhancing the purpose, and drive that will propel towards achieving the goals and potentials. This study aims to analyze the motivational practices of science teachers and its effectiveness in encouraging learners which will offer insights and strategies in improving the interest of learners along with increased performances and positive and productive learning environment.

There are various methods that the learners could be inspired. Students who think they're capable, assuming that they will succeed, are more anticipated to be driven, persistent, and more adaptable conduct compared to pupils who think they are incapable of well, thus they won't be successful. Researches additionally demonstrated that these confident kids are more interested in studying and thinking than pupils who doubt their skills.

Zarate explained that motivation is the passive desire to achieve success and accomplish a particular objective, whether it is the drive to fulfill a fundamental need or the ego to demonstrate Motivation can originate from within a person or possibly an environmental stimulus. The process of motivation begins with a need, and when the need is satisfied, the individual descends to the bottom of the continuum under need fulfillment.

On the other hand, Wright presented there are several reasons why students are unmotivated, including: (1) Students are unmotivated because he cannot accomplish what (2) Students are unmotivated since the response effort required to complete the assigned work is outstanding; (3) classroom education is not engaging; (4) students did not see an adequate pay-off for the assignments, (5) due to inadequate self-efficacy and a lack of confidence in his ability to do the prescribed tasks; and (6) He lacks a positive bond with the teacher.

Students will become more motivated when they see teachers are well-prepared, well-equipped, and always show interest to motivate students at all times. To understand engagement, teachers must know first what are the needs and interests of learners, this is a driving force in motivating learners in class. Student achievement is mostly dependent on motivation and involvement. involvement in class, learning objectives, school happiness, academic success, and learning. Collie and Martin expounded that motivation is a person's propensity, vigor, guidance, as well as motivation for learning and accomplishment. Capunitan et. al. said it influences how much time and effort they put into learning, how they ask for assistance when they need it, and how they engage and actively participate in daily life. class. If

students aren't motivated, it is hard, or maybe unfeasible, to improve their academic achievements irrespective of the quality of the material or the instructor.

Culita and Puertos in their research study findings, the findings have applications for teachers and legislators. The focus should be on active teaching methods and instructional techniques that support motivation and involvement of students. encourage the need for a more comprehensive method of teaching enhancement—one that incorporates classroom administration with more comprehensive psychological and factors related to instruction. Authorities in education are urged to work toward inclusive policies, stimulating, student-focused learning settings to encourage both academic achievement and personal growth.

Gbollie said that the subject Science, being a difficult subject, needs students to be motivated far more than other subject areas like English or Mathematics. Unlike other subjects, however, where the teacher could use the learner's schema easily to motivate them, Science is mostly analysis and processes and by the name of the course alone, students cringed and avoid it. Science being one of the toughest subjects, the teacher needs to further encourage students to learn and motivate them so that they will arrive at their which they could tackle the problem. Additionally, motivating behaviors are essential to kids' academic success because they influence how much they will think about, value, work hard, and demonstrate interest. Mauliya et. al. explained that several things will affect students' academic performance, especially those related to motivation. It starts from within the students themselves, from the family environment, and even lecturers greatly affect student motivation in improving academic performance. It should not only focus on the mistakes made by students, as there must be a cause behind it all. In a nutshell, the results of the study revealed that one aspect of internal factors causing poor academic performance was the lack of motivation derived from two sizeable directions, family and teacher.

Fishbach and Woolley described that the secret to perseverance in work is intrinsic motivation. People experience labor when they are intrinsically driven. Activities as a goal in and of itself, so that the activity and its objectives collide. Increased interest in and enjoyment of work-related activities is the outcome. Capunitan et.al. discussed in their study that as their intrinsic desire increases, pupils like participating in class. They get more involved and content with their instructor and the manner the lessons are delivered. They actively participate in the discussion while developing their skills, independence, and sense of purpose.

Motevalli et. al. cited in their study, a drive that influences the behavioral, emotional, and cognitive components of students' attachment to the educational process is another definition of accomplishment motivation. It was observed that the level of competition and excellence can lead to motivation for achievement by using assessment of performance. Put otherwise, it's a type of motivation that meets high performance standards it is distinguished by a

spirit of competition. Moreover, “achievement motivation also consists of various and complex evaluations, estimates, inferences, values, standards, set of assumptions and emotional reactions that may be unreasonable, flawed, and contradictory.”

Welsh et. al. discussed one of the ideas in organizational behavior that is most studied and used in practice is goal-setting theory. This theory's central claim is that performance is improved by setting clear, difficult goals. However, the question of how high-performance goals might be used to promote achievement without also encouraging unethical behavior remains unresolved, according to new behavioral ethics research. We look at the importance of objective type in asserting that an excessive dependence on goal difficulty as a motivational strategy and an excessive reliance on results objectives as motivators for performance have both created the negative aspects of goal-setting and hidden potential solutions, drawing on accomplishment goal theory.

The ultimate goal of motivational practices employed to the students is to improve both the personal and academic growth and development. The learners are more motivated to learn something new if they are being heard and given the opportunity to speak and participate freely. Occasionally, certain pupils are eager to understand a subject regardless of the advantages or rewards they will receive from that education procedure.

Teacher must be the number source why students are eager to learn and go to school and willing to learn many things in life. Teachers have the crucial responsibilities in dealing with the different behaviors and attitudes, backgrounds, and economic status which are sometimes factors why students are unmotivated to learn. Students become motivated when they feel safe and comfortable, especially during the times that they feel being seen. Additionally, teachers must always keep the fire in their hearts in motivating all types of learners.

Sanchez and Yang findings in their study showed that even when the educators used incentive techniques for strictly motivating reasons, they also employed these methods for concurrently facilitating inspiration and education. Additionally, there is proof that educators might employ incentive techniques only for their influence on pupils' education, without having aware of their possible implications on motivation.

Quijanés simplified that nowadays, practical motivating techniques are the main focus of research, but a comprehensive summary of these studies' conclusions is lacking. Teachers must use differentiated and developmentally appropriate learning activities and experiences to address the learner's gender, needs, strengths, interests, and classroom experiences in order to motivate students. This is because classrooms vary, and there are reasons to believe that certain strategies will work better with some groups of students and differently with others depending on classroom culture. differs from each other.

Hornstra et. al. elucidated teacher are important players who influence the educational setting and whose primary responsibility is to inspire kids to learn. Teachers can vary in how they attempt to inspire pupils to learn and their drive to techniques might range from encouraging autonomy to regulating.

Alimbon et. al. explicated that student feel satisfied when they are highly motivated to achieve their goals whenever they learn the content of the course, get high grades, solve challenging problems, and when their ideas are accepted by their peers or teachers. Further, students demonstrated a high regard for science learning. They thought that through learning science, they could develop their thinking and problem-solving skills. Also, learning science is helpful in their lives and helps them satisfy their curiosity. A high level of motivation in the factor active learning strategies showed that students could apply various strategies in knowledge construction. Indeed, to get high chance of improving academic performance in science signifies increased motivation to learn. By connecting the learners' previous experiences with science concepts, it will result to recognize the its relevance and can further discuss to their classmates and teachers that promotes positive learning environment and collaborative learning.

Bautista and Rogayan clarified that students won't be able to fully understand the material they are learning if they lack motivation. Extremely driven students are totally focused on the classroom, tasks, engaged in class discussions, and dynamic in the educational activities. As a result, teachers need to engineer appropriate motivator strategies that would work both the pupils' interests and learning preferences. Additionally, motivational techniques aid in learning procedure for the pupils to keep equilibrium when studying while having pleasure in various ways activities. Escuzar emphasized the significance of context when modifying tactics for particular technical, cultural, and educational settings. As a result, it is critical that scientific educators and legislators create teaching strategies with adaptability, cultural awareness, and continual assessment. Making science lessons and activities in a more meaningful, engaging, and fun way can boost the interest of learners while learning. Motivational strategies applied by science teachers must be fit in all types of learners rather one fit-size classroom.

Nwafor affirmed that one way to encourage students' interest in basic science and technology is through effective teaching methods. In a Basic Science and Technology classroom, the instructor must be able to choose the best teaching strategy for a given idea. Hornstra, et. al. additionally explained teachers have a crucial role in creating the learning environment, and one of their primary responsibilities is inspiring students to learn. Teachers may try to inspire students to learn in many ways, and each teacher may use different motivational techniques. It is proven that science teachers have many motivational strategies applied in classroom setting, however, teacher consider the most effective strategies that enhances learners' motivation and interest in the subject that could results to

positive and improved outcomes, preparing the learners to become lifelong learners and equipped in their future careers.

Lamb explained that whether or not educators feel accountable for student motivation, another crucial topic is how frequently they consider this part of their work during planning, instruction, or reflection, and if so, how this influences their conduct. Here, the utilization of a ‘small lens’, to produce “illuminating small-scale studies of motivation in relation to specific learning events and experiences, and... grounded evidence-based analyses of how teachers work with and enhance their students’ motivation”. Lawrence & Hanitha expounded since student academic achievement has raised educationists' concerns, education has evolved beyond simply the process of learning. Teachers in emerging economies have implemented several strategies to improve pupils' learning. Research demonstrates the importance of motivational techniques in fostering students' academic success. Cioca, et. al. identifying the elements that encourage the student's academic achievement necessitates examination of various teaching methods that affect teachers' own effectiveness. Given the increasing variety of teaching methodological, educational, and motivational tactics have received a lot of attention, possibly leading to teachers should utilize them as the crucial standard of exceptional academic achievement. From comprehending the science underlying motivation to become proficient in evidence-based, practical teaching techniques, educators will be prepared to change the transforming the classroom into a hub for participation and accomplishment. Recall that inspiration is not a miracle change, but a garden that need care—through meaningful connections, pertinent education, and development cultivating a positive mindset, using technology wisely, and evaluation. Teachers that show enthusiasm in teaching-learning process in motivating learners will create positive learning environment, preparing the learners in the best way possible by keeping them informed, aware, and interested to learn.

The researcher is currently teaching science in secondary level and he himself experienced applying different motivational practices in increasing the interest of learners in science education. This study will supplement the critical analysis and scholarly communications about the motivational practices employed by science teachers in increasing learners’ interest. He also observed that most of students in high school find science as challenging subject. So, in this aspect, the researcher hypothesized that learners must keep motivated to learn the science concepts and gain scientific skills, equipping them for future endeavors. With this in mind, he investigated the motivational practices employed by teachers in teaching science in junior high school within the Juban District.

II. STATEMENT OF THE PROBLEM

This study aimed to find out the motivational practices of teachers in teaching science and its effectiveness at Junior High School within the Juban District. Specifically, this sought answers to the following questions:

- What are the common practices of teachers in teaching science to motivate learners?
- What is the level of effectiveness of the practices of junior science teachers in motivating learners?
- How do learners assess the effectiveness of the different practices employed by junior science teachers in motivating learners?
- What are the challenges encountered by science teachers in motivating learners?
- What innovative teaching practices can be proposed to improve the interest of learners in science?

III. METHOD

This research used a mixed technique, quantitative and qualitative methods. Quantitative descriptive survey method was used because it is a type of research that focuses on anything that can be measured and examined which affects the lives of those it interacts with. Qualitative method because it accurately portrayed the characteristics of a situation.

The participants of this study included twenty-five (25) junior high school science teachers and sixty (60) randomly selected junior high school students in their respective secondary schools within the Juban District. The questionnaire checklist and surveys were used to evaluate the motivational practices employed by junior science teachers, its effectiveness, as well as the challenges encountered by junior science teachers. Additionally, the structured interview was carried out to assess by the students the motivational practices employed by junior science teachers. The data gathered examined using descriptive statistics including ranking, mean, and total of ranks. After that, the gathered data underwent thorough statistical analysis to produce conclusions and draw conclusions.

IV. PRESENTATION, ANALYSIS, AND INTERPRETATION OF DATA

This systematically presents and discusses study findings, aligning data discussion with raised questions. Objective analysis, accompanied by tables and enhances precise interpretation. Each research question is addressed through tables and discussions, ensuring findings, analysis, and interpretation of data gathered are valid. Qualitative data and information are presented in a thematic format, while the quantitative data are organized in tables. Statistical scrutiny of the data is further provided in this chapter.

➤ *Common Practices of Teachers in Teaching Science to Motivate Learners*

Junior high school science teachers employ various practices to motivate learners, focusing on engagement, relevance, and nurturing a growth mindset. These common practices of science teachers in motivating students aim to make science accessible and exciting for all types of learners. Han claimed that that using effective teaching techniques is one of the most significant elements in the learning process. Bibon affirmed that rooms for improvement in the teachers’ instructional practices need to be carried to raise the academic achievement of students in science. Magayon and Tan mentioned that individualizing instruction to provide students a sense of belonging was a common technique among teachers in the Philippines' past curricula. The science teachers' responses regarding lesson planning for differentiation serve as both a testament to the establishment of child-centered instruction and a defense of the body of knowledge already available in the field of education. In every plan of the teacher in classroom setting, it is always for the betterment of learning experiences to motivate learners in the best way possible.

Table 1. Common Practices of Teachers in Teaching Science to Motivate Learners

Common Practices	Sum of Ranks	Final Ranks
Integrating technology such as simulations and videos	39	1
Connecting concepts to learners' lives, interests, and current events	57	2
Incorporating experiments and projects	75	3
Encouraging learners to ask questions, investigate and discover scientific knowledge for themselves	103	4
Using pictures and diagrams	133	5
Showing students how science concepts applied in the real world contexts	152	6
Incorporating group works pairing of learners	175	7
Providing positive feedback to learners about their achievements and learning	196	8
Using formative assessment, such as quizzes, observations, and discussion	214	9
Providing choices to different learning preferences	231	10

Table 1.0 presents the different common practices employed by junior science teachers in motivating learners within the Juban District, along with their corresponding frequency of use and ranking based on usage. The findings indicate that integrating technology such as simulations and videos are the most frequently employed by junior science teachers, with 39 sums of ranks and ranked 1. This present that integrating technology such as simulations and videos serve as an teacher to develop a more captivating and accessible educational setting that inspires and attain each learner's maximum potential. Hunt and Miller supported this finding where it stated that a person who is digitally savvy will have a variety of digital abilities, familiarity with the fundamentals of computing gadgets, proficiency with computer networks, the capacity to participate in social networks and online communities while following behavioral guidelines, being able to locate, capture and assess data, a comprehension of the difficulties in society

brought forth by digital technology and possess critical thinking abilities.

Following integrating technology such as simulations and videos, connecting concepts to learners’ lives, interests, and current events ranked 2, with 57 sums of ranks from junior science teachers. Understanding the scientific basis of a problem empower learners to think about potential solutions and the role of science in addressing societal challenges. Connecting science concepts in the lives, interests and current events to learners is a cornerstone of effective teaching and powerful motivator. Ali and De Jager supported through their affirmation understanding the fundamental ideas of the sciences, their tenets, and how they relate to daily choices is essential for ensuring motivation. In ranked 3, incorporating experiments and projects are utilized by junior science teachers with 75 sums of ranks. The integration of experiments and projects into science subjects is not merely a trend but a fundamental change towards enhancing deeper understanding, critical thinking, and genuine scientific inquiry. Thus, by moving beyond theoretical concepts to tangible investigations, students are empowered to observe, hypothesize, test, and analyze, thereby constructing knowledge through direct experience. Abrahams and Reiss stated that practical labor is a common component of science education, which is often meant to aid pupils in developing conceptual comprehension, practical and broader abilities, and knowledge of the workings of science and scientists. In addition, there are some indications that more frequent practical work associates with benefits. Hamlyn et. al. discussed for instance that although this does not fully capture the influence of practical work alone, students in higher-performing secondary schools have reported engaging in practical work more frequently than students in lower-performing schools. Oliver et. al. analyzed “in their analysis of the science scores in the six Anglophone countries (Australia, Canada, Ireland, New Zealand, the UK, and the USA) that participated in PISA (Program for International Student Assessment) 2015”, found that “Of particular note is that the highest level of student achievement is associated with doing practical work in some lessons (rather than all or most) and this patterning is consistent across all six countries.”

Encouraging learners to ask questions, investigate and discover scientific knowledge for themselves is ranked 4 with sum of ranks of 103. Empowerment is one of the primary objectives of science education people to adopt a scientific mindset. Rother defined scientific thinking is a useful life skill in creating solutions for any circumstance. Cloude et. al. declared that that it is a necessary ability for everyone, particularly in light of the numerous environmental, health, and economical issues the globe is currently dealing with. Oh, and Yang explained that the process of formulating questions, gathering data, analyzing information, and coming to conclusions is known as scientific inquiry. It is ingrained in many domains, including as daily life, culture, and science. Due to society's rapid advancement, people are expected to possess not just the information that already exists but also the capacity to investigate uncharted territory and resolve challenging

issues. Curiosity-driven scientific research is not just the foundation of scientific inquiry but also an essential approach to personal learning and cognition. By means of through scientific investigation, people can learn to cultivate creative and critical thinking abilities, which are necessary in today's world. The same study found out that teachers should encourage students to formulate theories about the things they see and create straightforward experiments to test them using guided questioning. Children can hone their logical reasoning skills and acquire the fundamentals of scientific inquiry through this approach. Teachers can help students generate hypotheses and conduct experiments to test them. For example, they may inquire, "If I water this plant twice a day, will it grow faster than if I only water it once?" Teachers can then assist students in observing the growth circumstances of various plants to confirm their theories through experimental design. Children can gain a deeper understanding of scientific concepts and build critical thinking skills through hypothesis and reasoning through this process of experimentation and verification. By honing these techniques, kids can develop their scientific thinking and inquiry abilities while learning about scientific phenomena in the classroom and in daily life. These methods support children's language development in addition to considering their cognitive traits, expressiveness, capacity for reasoning, collaborative learning, teaching critical thinking using a variety of instructional strategies. Using pictures and diagrams is ranked 5 with sum of ranks of 133. Visual aids like pictures and diagrams can make the lesson and discussion more engaging and easier to understand. They help capture attention and simplify complex information. By utilizing pictures and diagrams in the lesson proper, it integrates creative thinking and science teachers can create a more dynamic and effective learning environment. In relation to this result of study, Erduran, Evagorou, and Mäntylä suggested that when teaching science, the focus in visualization ought to move away from cognitive comprehension—using scientific findings to comprehend the subject matter—to participate in the procedures of visualization. Additionally, the researchers recommend that it is necessary to create instructional materials and learning settings that foster an epistemic and social context and encourage pupils to practice visualization as proof, logic, and experimentation process, or a way to communicate and consider these methods. Consequences for teacher preparation include the necessity of professional development for teachers. Applications that challenge the usage of visual representations as components of epistemic objects scientific methods. Supporting the claim of Erduran, Evagorou, and Mäntylä, in the research study of Stegmann underlined that the significance of interacting with visual models as part of a learning process where text and visuals are both essential components of how our brain interprets and manipulates information. They discovered that diagrams and their modifications constituted a "interpreted formal system" and that, as a result, altering marks can be a dependable method of producing diagrammatic results that are interpretable in terms of real-world targets. Eldawati showed that learners' learning creativity can be enhanced by employing the picture and picture learning approach.

In ranked 6, with sum of ranks of 152 is utilized by junior science teachers, showing students how science concepts applied in the real-world contexts. Science subject is not just only about textbooks and experiments, it is all about around us, from the technology we use every day to the natural phenomena we observe, science is essential in forming our comprehension and encounters. Ryan stated for instance, case studies derived from real-world scenarios and problem-based learning modules are particularly useful for encouraging critical thinking among pupils and scientific investigation. Reyes asserted that the incorporation of real-world issues into chemistry courses marks a critical advancement in scientific education, providing students have the chance to close the gap between theoretical understanding and real-world implementation. By connecting abstract concepts to tangible, real-world challenges, this pedagogical strategy not only enhances the relevance of chemistry but also transforms it from a theoretical discipline into a dynamic, engaging field of inquiry. Students are better equipped to understand the direct impact of chemistry on worldwide concerns including public health, sustainable energy, and climate change, thus fostering deeper engagement and motivation. In the findings of his study, he stated that beyond increasing student engagement, the integration of real-world problems also functions in educating students for the intricate multidisciplinary problems of the twenty-first century. As global issues become increasingly interconnected, it is essential that future scientists, policymakers, and informed citizens possess the skills to navigate these challenges.

Ranked 7 is incorporating group works pairing of learners with 175 sums of ranks. Incorporating group work and learner pairing is crucial for effective learning, it promotes active learning, reinforcing learners understanding, learners are exposed to different viewpoints, enhances communication and teamwork, allows students to gain knowledge from one another's tactics and create more potent solutions, boosts confidence, and creates supportive learning environment, and preparing students for teamwork-based tasks in their future careers.

Rosa-ut explicated that collaborative learning is a learning strategy used by educators with their learners to facilitate learning and help them improve academic performance. Students' experiences may vary from the subjects that require collaborative learning strategy, the environment where the learning is situated, and their particular needs, interests, and wants. The learning experiences of the students are divided into themes; these include: 1) agreement, 2) satisfaction, 3) preference, 4) challenges, and (5) coping mechanisms. Additionally, as stated in the findings in the research study, the findings were reported better student performance as a result of peer conversations in groups where the discussions led to a better comprehension of ideas even when none of the group members had previously been familiar with them. Additionally, research revealed that while high ability students fared equally well regardless of the type of grouping, lower ability students performed better when they were in groups with peers of different abilities. Van Wyk

recommended in his study that group education can be a creative way to promote fruitful educational opportunities and cross-cultural interactions that transcend cultural boundaries. Cohesion in the classroom and increased self-directedness were enhanced by even a small amount of group work. Following incorporating group works pairing of learners, providing positive feedback to learners about their achievements and learning ranked 8, with sum of ranks of 196. Providing positive feedback to learners about their academic achievements and performances in science subject is essential for their motivation and development. Positive feedback enhances self-esteem, recognizing the efforts and success, help students understand and remember key concepts, the efforts are being valued that motivates students to keep trying, even when facing difficulties, it also supports a love for science that feels them connected to the subject and helps students see learning as a process of growth.

Charalampous and Darra stated that teacher feedback plays a crucial role in the teaching and learning process since it enables teachers to give students an unbiased evaluation of their work and assist them in raising their academic standing. Students who were given constructive criticism enhanced their performance, improved their grades, and created the abilities to comprehend ideas, engage, and communication, (2) providing feedback has an effect on academic achievement, conduct, and general advancement, (3) pupils' academic motivation and teachers have a favorable impact on performance. feedback, as opposed to self-evaluation, (4) instructors' feedback improved students' learning. accomplishment, independent of peer conversations, (5) corrective comments from teachers, both written and verbal, had a favorable effect on the pupils' academic achievement, because it considerably lowered their anxiety levels, (6) giving thorough feedback enhanced students' writing, students used integrative feedback constructively. to improve their writing skills, and (7) the instructors' giving students summative feedback enhanced their academic achievement through effective communication and educational goals.

In the number 9 rank is using formative assessment, such as quizzes, observations, and discussions with sum of ranks of 214. Formative assessments like quizzes, observations, and discussions are important tools in science education for it tracks progress of learners, teachers can adjust the teaching methods based on the insights gained from formative assessments, regular quizzes and discussions keep students actively involved in the learning process, frequent assessments reinforce learning, improving long-term retention of scientific concepts, and regular practice prepares students for major exams.

Pramesti supported this claim that formative assessment can help teachers discover areas where students need to develop, provide timely and relevant feedback, and design lessons that are appropriate for each individual student. Learners are urged to actively engage in the educational process, develop their capacity for critical thought, and assume responsibility for their personal achievement through formative assessment. The application

of formative evaluation can significantly improve students' learning. By offering targeted and continuous feedback, teachers can help pupils understand the material in-depth, developing metacognitive skills, and achieving educational goals. When placing when putting formative assessment into practice, it's essential that teachers choose a suitable method and evaluation tools that create an atmosphere that encourages learning that is focused on the student.

Gloria et. al. stated that sixteen mental habits, such as persistence, impulse control, listening with empathy and understanding, thinking flexibly, metacognition, aiming for accuracy, questioning and problem-posing, applying prior knowledge to new contexts, gathering information using all senses, creating, imagining, and innovating, responding with wonder and awe, taking responsible risks, finding humor, thinking interdependently, and remaining open to ongoing education, can be developed when formative assessment is used appropriately.

Ranked 10 and least utilized by junior science teachers in common practices of teachers in teaching science to motivate learners within Juban district with sum of ranks of 231 is providing choices to different learning preferences. Providing choices that cater to different learning preferences is vital for maximizing student success because it offers personalized learning where students have options to study in ways that best fit their unique needs and learning styles. Students are more motivated and engaged in the material when they have a voice in how they study.

Alabi discussed that the way that students take in, process, and remember information is greatly influenced by their learning styles. Understanding each student's distinct learning preferences and strengths enables teachers to modify their teaching strategies for better learning results. The VARK model—Visual, Auditory, Reading/Writing, and Kinesthetic—is frequently used to describe learning styles, which are based on the notion that children learn best when they are taught in a fashion that corresponds with their innate inclinations. Visual, Auditory, Reading/Writing, and Kinesthetic. Teachers can promote active engagement, improve information retention, and assist the development of critical skills by implementing differentiated teaching and matching learning activities with diverse learning style preferences. The ability to accommodate different learning styles is further enhanced by the strategic integration of technology, creating new opportunities for tailored and flexible learning experiences. Teachers must have the tools, resources, and chances for professional growth they need to recognize, comprehend, and successfully accommodate their students' preferred learning styles. Teachers can foster dynamic learning by keeping an adaptive and flexible mentality. settings that enable every student to succeed.

Diack, Lawson, and Pablico inferred that it can be inferred from their study's qualitative results that teachers see differentiated teaching favorably. Student engagement and performance in the classroom are enhanced when teachers employ a variety of diverse instructional tactics. They believe that they learn more efficiently if the

instruction is given utilizing their individual learning preferences and whether the tasks are in a variety of format. They are more involved in the process of learning if they are offered a selection of assignments and tasks to do and the kind of group structure to collaborate with. They concur that educators ought to be conscious of learners' preferred methods of learning and ought to make advantage of information to create activities that are appropriate for them.

➤ *Level of Effectiveness of the Practices of Science Teachers in Motivating Learners*

Table 2. Level of Effectiveness of the Practices of Science Teachers in Motivating Learners

Practices	Weighted Mean	Description
A. Real Life Science Connection	4.39	Effective
B. Visual and Graphic Representation	4.38	Effective
C. Feedback and Proactive Reaction	4.36	Effective
D. Connect Scientific Concepts to Everyday Experiences	4.34	Effective
E. Collaborative and Dyad Engagement	4.33	Effective
F. Experimentation and Project Based Incorporation	4.32	Effective
G. Technology Integration	4.30	Effective
H. Inquiry-Based Engagement	4.30	Effective
I. Learning Preferences and Styles Recognition	4.02	Effective
J. Performance and Learning Assessment	4.01	Effective
Average Mean	4.28	Effective

Shown in the table 2.0 is the level of effectiveness of the practices of science teachers in motivating learners. There were ten practices employed by junior science teachers particularly within the Juban district and there were three indicators in each practice, and all of these obtained mean values of which were described as effective. These results implies that junior science teachers teaching science subject in Juban district as respondents of this study employed practices effectively in motivating learners.

The results indicate that junior science teachers at Juban District are effectively utilizing different motivational practices in empowering learners, with an overall mean of 4.28.

The highest-rated motivational practices employed by junior science teachers in Juban district include real life science connection with mean value of 4.39 with description of being effective, suggesting that junior science teachers can transform abstract concepts into concrete applications that students can relate to, sparking the learner's interest, and engaging learners cognitive, psychomotor and affective skills.

Scientific knowledge encompasses more than just knowing or doing science. Lederman and Lederman described that to enable students to become scientifically literate people who can make knowledgeable decisions on matters pertaining to their individual life, society, and the global community. The scientific need in daily life and its relevance to Every choice made in society cannot be overemphasized. Ali and De Jager Scientific illiteracy is a key factor in why students are taught science in the classroom but are still unable to apply what they have learned. This will only be addressed when science is taught

with an emphasis on understanding its applicability, value, and connection to social well-being rather than topic mastery.

Ali and De Jager suggested the use of real-world and authentic learning methodology. Consequently, encouraging learner's creation of personal knowledge as a consequence enabling students to make connections between the applying what they learn in class to their daily lives. Kobylarek explained that calls for an alternative method of conducting scientific research. The development of cool, beautiful theories must be abandoned in favor of "dabbling" in real-world issues and producing something akin to action science, which is strongly related to this kind of scientific inquiry. The strong collaboration between researchers and practitioners—academics, volunteers, employees of the organization, and local community representatives, who are capable to create a successful cooperative network for actual and particular issues.

Next to real life science connection is visual and graphic representation with mean value of 4.38, describing as effective. Visual and graphic representation is very important in science education because they help make concepts more understandable and through utilizing this practice, science teachers can tap into different learning styles, improving memory retention, and enhancing deeper gratitude for the topic.

Evagorou et. Al. recommended that while teaching science, the focus should move from cognitive understanding—using scientific products to comprehend the material—to participating in the visualization processes. Additionally, the researchers contend that it is critical to create learning environments and curriculum materials that foster a social and epistemic context, encourage students to use visualization as evidence, reasoning, an experimental process, or a communication tool, and reflect on these practices. The necessity for teacher professional development programs to question the use of visual representations as epistemic objects in scientific processes is one of the implications for teacher education.

Buckley and Nerantzi additionally expounded that it is the duty of lecturers to thoroughly consider lecture design, to utilize visual aids in their professional activity. This may result in a more successful utilization of growing amounts of data and visual materials for instruction and learning, as well as improved comprehension between coworkers and students. Visual Representation can be a very useful tool. phases of teaching research. diagrams, images, pictures, pictures, conceptual maps, tables, and matrices Graphical charts are more than just visual depictions of what is being found via analysis, but also as analytical and generative methods as well as communication instruments.

Prabha threw some insight on students' metacognitive abilities. It is evident that students are aware of challenges in their conceptual grasp of science; they are able to pinpoint the causes of these challenges and articulate well-informed opinions to confront and resolve them. They are aware of

their preferred method of learning. It provides educators and policymakers with an extremely hopeful paradigm. Bae & Lai expressed that students must be able to solve problems, cultivate a feeling of curiosity about the subject, and make informed decisions when learning science. Miller et. al. enumerated the idea of science education, which involves pupils comprehending the issue and taking part in the process of addressing it. Fredricks et. al. argued that learners may continue to engage in science-related learning areas in the future if they actively participate in learning activities. Nazareno highlighted in his piece that in order for students to understand the fundamentals, they should start with a shared set of "Starter Kata," or beginner practice routines, will quickly result in the creation of a common set of scientific cognitive abilities among team members. They concluded that even despite using new abilities requires work and some initial annoyance, The ability to think more scientifically inside teams, the more capable they are of overcoming obstacles that could have appeared really challenging at first.

Feedback and proactive decision are the next practice of science teachers with mean value of 4.36, with a description of effective. Effective feedback and proactive decision-making are essential for empowering learners in science, by providing positive feedback and encourage learners for active participation, educators can enhance a more motivating learning environment. Obilor claimed that feedback is crucial to programs for training and education. It enables students to optimize their abilities at various training phases, increase their understanding of their areas of strength and enhancement and determine what needs to be done to improve performance. Feedback involves providing details in a in a style that motivates the receiver to accept it, consider it, get knowledge from it, apply it, and ideally make adjustments for the better. Feedback is a crucial component of the atmosphere for teaching and learning. It improves the integration of the abilities, actions, and knowledge of instructors and students in the classroom. Comments are essential to teachers' and students' growth in proficiency and self-assurance at every stage of education. It explains excellent performance, aids in the growth in self-evaluation and provision of high-quality information for educators (to enhance instruction) and students (to improve learning).

To suggested that when educators are in search of a more effective feedback approach, engaging students as feedback partners sets a promising direction for increasing learners' responsibility and proactive recipience. The partnership approach emphasizes the joint efforts of students and teachers in co-creating productive feedback in a psychologically safe environment, with dialogue and trust as precursors and respect, reciprocity and shared responsibility as core values. Such collaborative endeavors not just enhance feedback uptake and quality, but also support learner autonomy.

Connect scientific concepts to everyday experiences is also effective with mean value of 4.34. In the Philippine setting, the Department of Education (DepEd) encountered

many difficulties in raising academic standards, particularly in science instructing. Low academic performance is a problem in many schools. performance and insufficient laboratory expertise among pupils, emphasizing the necessity of creative instruction techniques. In this regard, active learning exercises stand emerged as a viable strategy to improve scientific abilities. Among students, these exercises entail practical encounters and interactive exercises that promote pupils to interact directly with scientific ideas, promoting greater comprehension and competence.

Olajide and Olude cited from the study of Tsurusaki, it is advised that educators employ teaching methods that situate science education within the background of students' everyday lives in order to assist students close the knowledge gap between science and their daily existence.

Collaborative and dyad engagement are also effective with mean value of 4.33 utilized by junior science teachers in Juban, Sorsogon. Lone in peer-to-peer trust and confidence, mentioned that self-assurance had a big part in academic performance improvement, education, and achievement. Self-confidence was discovered to be a predictor of academic performance. Increased self-assurance improves the academic achievement. But both educators also as self-esteem was much enhanced by parents. as well as students' faith in their ability to academic achievement and capacity for learning among learners. Que et. al. avowed that in strengthens conceptual understanding and oral language skills, establishing science process abilities as the advantageous a useful predictor of conceptual understanding information to help educators prioritize scientific process abilities that promote a deeper comprehension of scientific concepts. In addition, in links science with teamwork and engagement, the science of teams has advanced significantly in a number of areas, such as the creation of multilayer theoretical frameworks to handle the dynamic nature of teams, their composition, and the procedures that result in team efficacy and the recognition of non-intrusive metrics for group procedures and results. As cooperation research is ongoing, and attempts are being made to (a) address problems with technology to create additional advancements in team evaluation, (b) get additional knowledge on multiteam systems, and (c) close the gap between theory and practice.

Jiang et. al. stated that learning objectives and collaborative experiences were not considerably impacted, by learning context and group size, but for peers' interaction, the dyad group displayed more interaction and communication during the learning process procedure. Overall, the dyad group demonstrated more and more consistent scores across the board, in addition to being able to adjust to shifting learning environments. Three recommendations for putting collaborative learning into practice. Initially, for instructing sizable classes with plenty of learners, we advise educators to select groups of four for cooperative education. Due of the quad's influence and dyad groups did not change between situations, the benefits of the quad group in effective management could lessen the strain

for teachers. Secondly, if a cooperative learning exercise is mostly offline, and encouraging social interaction is the main goal. and discussion, after which educators are urged to select dyads rather than quad groupings, as the former can promote increased peer contact because of strong real equal partnerships and offline communication while working together. Lastly, for the creators of platforms for online learning, it is important that A feature that enables educators to choose group size and classifications based on particular teaching circumstances, learning assignments, class size, and other elements.

With an average mean value of 4.32, experimentation and project-based incorporation found out that it was effective in the level of effectiveness of the motivational practices employed by junior science teachers. Ondoy, et. al. in active participants in manipulating and observing outcomes, suggested that learners learn more effectively when there is interaction with methods of experiential learning utilized both within and beyond the classroom. Recognizing and appreciating the variety of students' teachers can adapt their methods based on students' learning preferences. techniques and produce a more captivating and efficient environment for learning science while allowing learners to see consequences of their actions and refines their understanding. Muttungal and Titus pointed out that a student must possess the ability to reflect because it is frequently considered by educationists to be a crucial quality of superior academic performance. Opinions are consistent. Reflection is a valuable learning tool for instructors. approach. However, the instructional methods presented by teachers ought to give pupils tasks to participate in introspective activities both inside and outside of the classroom.

Maspul detailed that by preparing students for future career opportunities, including technology and coding into project-based learning creates a dynamic and interesting learning environment and arming them with highly valued digital skills. As educators refine and adopt these methods, they contribute to the evolution of effective instructional approaches and equip students to survive in a technologically driven society. Educators can produce captivating and immersive educational opportunities that promote greater comprehension, critical thinking, collaboration, and creativity in STEM subjects by embracing innovative teaching approaches such as Project-Based Learning.

Technology integration and inquiry-based engagement were both had an average mean value of 4.30 with a description as effective. Aras et. al. demonstrated that in technology integration, specifically visualizing scientific concepts through simulations and augmented reality which makes learning engaging, utilizing tangible items and tools to incorporate understanding the structure of the object, bolstering the concept that learners are able to actively follow their passions and curiosity, feeling empowered in their investigation and application of augmented reality (AR) transforms teaching methods by offering an engaging experience using virtual 3D superimposition components

onto the real world. This Combining the virtual and physical realms tackles the difficulty in comprehending abstract ideas by allowing for the display of three dimensions and engagement. Arasy and Oskarita expounded that student who collaborated using digital technologies showed notable increases in participation, crucial thinking, interacting with peers, and incorporating digital incorporating gadgets into educational activities can improve the efficiency of group education. Sanchez described that science instructors use cooperative and individual pursuits should have a balanced strategy to studying science. When utilizing online collaborative platforms, educators need to have accessible channels for communication so that students can seek advice and express themselves, encouraging involvement when utilizing the platforms. In addition, educators must encourage self-directed learning while making sure that during learning, higher-order thinking abilities are used. activities. In the end, educators need to have opportunity for career advancement to improve their capacities as virtual educators who promote teamwork, both creativity and critical thinking.

Paguio mentioned that Phenomena-Based Learning is more than just a fad in education - it is a transformative strategy that redefines how science is taught and learned, As the Philippines embarks on curriculum reforms like MATATAG, embracing PhBL can empower both teachers and learners to see science not as a subject, but as a powerful lens for understanding life. PhBL making science relatable and anchored in the real world, when they can, students are more driven to learn and relate content to personal or societal issues, and when students see themselves as problem-solvers and thinkers, they begin to identify as young scientists. This is essential in building confidence and long-term interest in STEM. Kumar studying science in terms of egalitarian, immersive, and inclusive education these simulations are necessary. They involve students, allow them to comprehend challenging ideas through simulations, add excitement to scientific education, and encourage students to have a scientific mindset. Lederman and Lederman implied scientific knowledge is necessary to prepare students to become people that are knowledgeable about science and capable of making knowledgeable choices regarding matters pertaining to their individual life, society, and the global community. Among the reasons why science is taught to students in the classroom and are yet unable to put scientific knowledge to use essentially a problem of scientific ignorance. This will be discussed only when science is taught, not in order to master content, but to comprehend how to use it, worth and how it relates to the welfare of society.

Next motivational practice of junior science teachers in empowering learners is learning preferences and styles recognition with an average mean of 4.02, considered as effective. Dela Torre and Paglinawan clarified that learners typically have a strong inclination for learning in a variety of methods but the relationship link particular learning preferences and student involvement is not particularly powerful in science. According to their findings, although learning preferences are significant, additional elements

such as drive and enthusiasm for research are important in interaction. In order to encourage student involvement, the report advises educators to employ a range of teaching techniques that accommodate various learning styles, this involves employing talks, visual aids, and practical activities. Capunitan et. al. considered the significance that there is a connection between science education and life. The degree of student satisfaction with instruction approach and course material utilized creating a course the process's substance dictates the appropriate instruction technique to be applied in order to use an efficient teaching the pupils. Conel assumed that the majority of learners exhibit positive reactions and a desire to understand science in the three areas of developing attitudes and values, acquisition of scientific knowledge and notion development. The Respondents have a favorable opinion of science aids in their critical thinking development. Bartz et. al. proposed that if science and scientific instruction the community wants to enhance pupils' science education. must focus on pertinent, significant issues and engage in scientific procedures that are comparable to the real scientists' work.

The last motivational practice is performance and learning assessment having an average mean value of 4.01, described as effective. Osin and Sahoo discussed that Performance-based assessment has the potential to develop scientific skills in learners. Performance-based evaluation has the capacity to enhance students' scientific abilities. Performance-oriented the goal of evaluation is to evaluate and enhance the problem-solving abilities, knowledge application, critical thinking abilities, and learners' metacognition while they carry out all kinds of jobs. Performance Based evaluation in science creates distinct procedures abilities in students such as communication, measurement, experimentation, observation, inference, and classification. In the end, these abilities enhance students' learning and performance in science.

Discipulo advised that learners developed a feeling of autonomy in their educational journey. It's highlighted that giving pupils the freedom to take responsibility of their educational path and utilizing educators' Proficiency in facilitation establishes the basis for improved intellectual achievement in the teaching of science. Abulibdeh and Shana found out that it is essential to let pupils create some of their own student-centered experiments action), as this guarantees they don't merely adhere to directives from educators. Instruction that is focused on the teacher can be dull for pupils and have an impact on the advantages of practical work. Instructors were urged to think about how to set up classrooms where students will be more proactive, then show these settings to learners. Mella demonstrated a significant rise in student achievement and motivation after participating in contemplations. These beneficial effects can be linked to students' experiences with writing reflections, which include divided into five categories: reviewing and reinforcing ideas acquired; self-assessment, self-correction, and motivation to get better; contextualizing education; incorporating knowledge from several fields; and creating a community of learning. By recording what students have learned, students retain crucial knowledge like words and

ideas that were covered in class. Students make use of reflections as a way to assess oneself in connection to a specific expertise or ability. Reflections allow students to relate what they have learned to their everyday experiences. Additionally, students can make connections between what they study in a single subject. region to another.

➤ *How Learners Assess the Effectiveness of the Different Practices Employed by Science Teachers*

Assessing the effectiveness of science teachers' practices by learners is crucial for improving teaching quality, enhancing student engagement, and promoting meaningful science learning. The importance of learners' assessment on the different practices employed by science teachers are as follows, drives targeted teaching improvement, enhances student engagement, aligns teaching with learner needs, supports evidence-based education, and promote collaborative learning environment. Moreover, the assessment of learners on the effectiveness of science teachers' practices is highly relevant for advancing equitable, contextuality responsive, and student-centered science education. Also, the assessment help teachers identify and address the things that needs for improvement.

• *Experiencing Increased Curiosity and Engagement in the Tasks*

Numerous concepts have been exchanged by the research subjects on the benefits of the different motivational practices employed by junior science teachers in empowering learners within the Juban district. Respondents were very cooperative and appreciative of the advantages of these motivational practices for it empowers them as learners. Manjaly and Singh ascertained that curiosity has been shown to improve learning levels in schools as well as prevent students from dropping out of schools, both of which are a pressing concern. Curiosity appears to be a powerful way of inculcating a motivation to learn. Balaoro recommended that encouraging hands-on learning consistently hired by science instructors using a range of pertinent scientific exercises, and he emphasized that using an inquiry-based approach is the most popular method in involving pupils and developing their scientific abilities employed by educators of science. The fundamental as well as the developing sophisticated scientific abilities requires active educational exercises.

According to [P3, P5, and P11], they revealed in their responses that their curiosity and engagement were increased in science concepts. Participant 3 stated that *"I gained more knowledge about science concepts based on the given learning performance tasks by science teacher. Our science teacher let us grasp the learning activity, explore the procedure, and discover things on our own with the teacher's guidance."* (P3). This insight was supported by Participant 5 when he mentioned, *"Despite of some difficult topics, I got able to participate actively and learned something new in science subject because our science teacher guided us of what we need to do provided by the step-by-step procedure."* (P5). Based from these statements by two participants, providing varied learning performance tasks with step-by-step procedure in exploring and

discovering ideas given to students with proper guidance of the science teacher increased the performance of the students in science.

Along with this, Participant 11 highlight that *“Aside from time-to-time guidance of teacher in performing the learning tasks, the teacher constantly reminding us the students to follow the guidelines, be extra careful to the activities like using chemicals during laboratory experiments, and more significantly, she keeps on motivating us intrinsically that we can do it to have an increased academic performance if we work hard for it.”* (P11). This remarks from participant 11 reminds the teachers that aside from guiding the students based from science curriculum or subject matter, it is also relevant that utilizing differentiated activities, students grasping the activities on their own, and motivating the students to keep going, it could lead to increased curiosity and engagement among students.

In connection about the increased curiosity and engagement of learners from given learning tasks, Participant 7 expounded the claims from above that, *“Instead of giving us answers, one teacher starts every class with interesting questions like, “why do we need to breathe?”, “What will happen to us if there are no trees and plants?”, “Why we need to consider studying the topics in science?”, I got curious about the questions and based from that I investigated things related to questions and I even formulate further questions that can supply the needed information and made a mini-report. Through this, it increased my curiosity and become proactive in discussion and learning activities and it drives me to have motivation to learn and seek significant information that further explains the questions.”* (P7). Kidd asserted that curiosity could be useful as a metacognitive signal that shows when a correspondence between the educational resources offered and the learner's ability to encode it. Thus, learning results should therefore be based on individual differences. in the skills of metacognitive monitoring and control to keep an eye on and use one's knowledge, respectively.

- *Recognizing the Relevance of the Tasks to their Everyday Life*

The relevance of science learning tasks to learner's everyday lives is a foundation of effective education, as it transforms concepts into tangible, meaningful, experiences that drive for engagement, retention, and real-world applications. The alignment of science learning tasks with learner's everyday lives is non-negotiable pillar for meaningful, long-lasting scientific literacy. Its key impacts extend beyond practical skill - building to identify validation, with tailored relevance. Li et.al. findings showed that teachers do create lessons that have some relevance aspects incorporated, but that there are opportunities to support teachers further in integrating information that would provide specific direct relevance for students in a class. In addition, literature has shown that relevance instilled by relating science concepts to students' real-world experiences can help to impact students' motivation in the subject matter, thereby potentially increasing their

understanding of the content and perhaps even their overall achievement in the course.

The above information is also proved by [P9, P14, and P16], participant 9 posits that, *“As a student, there are so many things that I need to know and explore in science, from having questions I don't know the answers yet to exploring the learning activities scientifically. With hands-on practical activities, I learned to accept the fact that I can apply the skills in real-life setting and boost my confidence to study more about science in the future endeavor.”* (P9). Participant 14 also says that, *“With provided learning activities by science teachers promoting practical skills, I can apply it in real scenarios and become part of the changes in the communities in raising awareness and providing solutions to a certain problem.”* (P14). Indeed, the scientific practical skills are very relevant in the lives of students and other individuals, by having acquired from simple skills like raising awareness and do simple actions to a wider, bigger and complex solutions.

Postulated by participant 16, she explained the benefits of skills acquired of the learners in school particularly in science into real-world contexts, she says, *“As a student, it is not just only me who will benefit the scientific skills but also the people, environment, livelihood, and communities. Through these scientific skills, I can help people by educating them how to properly segregate and disposed our wastes, by that I am making a difference in protecting the environment. By simply doing recycling, it can create livelihood and if it was successful in the future, it can also help the communities, every one of us can be a catalyst for change.”* (P16). Tuazon stated that science education is essential for preparing kids to be responsible and knowledgeable citizens. In a society where issues include public health emergencies, climate change, and technology ethics, it is essential for individuals to have a basic understanding of scientific principles. By developing science skills, learners are better prepared to engage with complex societal issues, make informed decisions, and participate in discussions about topics like sustainability, health, and technology. This not only contributes to the individual's personal growth but also enhances their role in the broader community as proactive and educated citizens.

In conjunction of the mentioned ideas from participants 9, 14, and 16, participant 12 also highlighted that *“Doing experiments and projects in science, I really appreciate the learning and skills I acquired. The student like me become well aware of what I am doing because of the proficient and competent science teacher. I know that my science teacher is always prepared and equipped before going to our class.”* (P12). Arcillo et. al. supported the idea that the MATATAG curriculum in science education represents a crucial reform aimed at addressing the challenges faced by the Philippine education system and preparing learners for the demands of the 21st century. By emphasizing scientific literacy, technological competence, and environmental awareness, the curriculum aligns with global competencies and the needs of Industry 4.0 and Industry 5.0. As the Philippines continues to navigate the challenges of the digital age, the

MATATAG science curriculum provides a strong foundation for fostering a scientifically literate and globally competitive workforce.

- *Improving the Performance Caused by the Given Learning Activities*

Improved performance in science resulting from targeted learning activities is critical for individual, educational, and societal progress. For individual, strong science performance builds critical thinking, problem-solving, and data analysis skills, it also boosts self-efficacy, and proficient science learners are better positioned for high-demand in terms of career readiness. For educational, improved performance signals that learning activities are effective, guiding teachers to refine teaching strategies., targeted activities can also narrow performance gaps. For societal, science-literate individuals can make evidence-based decisions on pressing issues, strong science learners become the researchers, inventors, and policymakers who develop solutions to global challenges, and improved science performances empower communities to adopt sustainable practices.

Babazade and Oglu advanced that students actively participate in their education. they demonstrate greater levels of drive and participation, active learning techniques, which often involve applying knowledge to practical and problem-solving activities, enhance cognitive processing and retention of information, and students in active learning settings outperform their peers in traditional settings across STEM disciplines. The performance assessments used in their study revealed that students engaged in active learning not only scored higher on tests but also showed a deeper understanding of complex scientific concepts.

Participants [1, 6, and 13] supported the idea on improved performance caused by the given learning activities from science teachers. Participant 1 mentioned that, *“As compare to previous scores, I noticed that I got high scores in the present. I believed it was because of the peer teaching, pairing and grouping activities where we students can learn from one another by giving different insights about certain learning activity questions.”* (P1). Awadalbari explained that one of the primary strategies for enhancing pupils who supported the use of pair and group work in the target language should be the implementation of these activities. to maximize productivity when utilizing pair work and group projects that improve pupils' academic performance. On the other hand, participant 6 stated that, *“When it comes to my scores in science subject, I observed that there are times that I got low scores, there also times that I have high scores. I think I need to put an extra effort to improve my performances in science and with the help of my classmates and teachers, I can enhance it in the next learning activities.”* (P6). Consistency and taking seriously the learning activities are very important to get high scores, however, it is also considered that there are factors why learners got low scores. Adsuara et.al. found out in their study that when time is managed and distributed efficiently, learners in the sciences report higher academic achievement and learning.

In addition, participant 13 agreed that *“Different learning activities where we can choose, we are comfortable to do the activity if we can relate, resulting to understanding the lesson and getting at least an average score or even high.”* (P13). Toledo explained that differentiated instruction can be used by educators. in order to improve academic achievement of the pupils. Consequently, a student-centered strategy of instruction creates a productive learning environment. and outstanding academic achievement. Participant 2 also explained that, *“I struggle sometimes to have high scores in learning activities in science by not finishing on time, resulting to skip some questions to answer and got low scores. However, there are assessments like summative assessments and quarterly examinations where I have still the chance to have good academic performance.”* (P2). In relation to remarks of P2, Dickerson et.al. described that creating an evaluation procedure that provide consistent, excellent learning while promoting the welfare of students is a difficult but crucial task that calls for creativity and creative methods that go beyond an over dependence on summative tests with significant consequences. Dalumpines affirmed that students can readily understand the given proficiency within a specified time range and that they can result in improved performance if given sufficient strategic intervention resources to strengthen their learning.

- *Accepting Feedback from Science Teachers in Terms of Learning Performances*

Constructive criticism is a foundational pillar of science performances as it drives accuracy, innovation, and professional growth. By training performers to see criticism as a tool for development rather than a personal criticism, it fosters a growth attitude. Feedback and its core importance lie in bridging knowledge gaps, refining practical skills, and cultivating scientific habits of mind. Kanadlı and Özkale believed that the most common method used by science instructors' compliments in the classroom. But, they ought to use effort-based feedback more frequently. declarations in the classroom. Adhering to constructivism manner, educators should favor feedback statements that can help pupils study and move them to novel learning circumstances. Participants [4, 10, and 19] had remarks on the feedback of science teachers in terms of academic performances. Participant 4 says, *“Our science teacher updates all the students about the academic performances individually. I accepted the performances whether low or high scores because it is what I attained. If I have low scores in learning activities or even low grades on my report card, I motivate myself to study hard next time.”* (P4). Meanwhile, participant 10 mentioned that, *“In giving feedback, it must be constructive criticisms. I always experience to be praised by my science teachers because of my high performances, I am happy to accept those praises because it motivates me to work hard and maintain the high academic performances in science subject all throughout the school year and even though I have high grades, I still need feedback from my teachers.”* (P10). Charalampous and Darra showed that the availability of several types of instructor feedback considerably improved pupils' academic performance. Moreover, participant 19 brought forward that,

“Being the type of student who is afraid of what others will say about to me, I still managed to listen and accept the comments and suggestions of my science teacher when it comes to my learning performances. Teacher’s feedback is not something to be afraid of, it is about accepting facts to improve the learning outcomes.” (P19).

Participant 18 explained his experience in receiving feedback from former science teacher, he shared, *“I experienced to be ashamed in front of my classmates because my former science teacher said that the results of performances and examination are low. I chose to be quiet and still listen to my teacher because after all, that is a teacher to be respected. I recognized the feedback but deep inside, I am shy to my classmates who heard about my low performance in science.” (P18).* Kanadlı and Özkale discussed that science teachers give more negative, effort-based, and ability-based feedback to male students than to females. Teachers are therefore recommended to use less negative feedback and protect gender balance when giving effort-based feedback.

Kanadlı and Özkale discussed that science teachers provide more negative, ability-based, and effort-based based on evaluations given to male students as opposed to female students. Therefore, it is advised that teachers utilize less harsh comments and safeguard gender parity when providing feedback depending on effort. Hasan stated that in order to effectively improve students' skills and learning capacities, instructor feedback is crucial. Goh et. al. highlighted the problems with the pupils in their scholarly section that must be carefully assessed and patience to deliver precise and useful comments. It is evident that educating pupils about their performance on tests and projects using feedback process enables them to comprehend the places that must be enhanced for future improvement.

- *Honing the Mastery of Science Concepts into Hands-on Practical Skills*

Bautista expressed that honing mastery of science concepts is foundational to academic success, professional competence, and meaningful scientific contribution – going beyond rote memorization to enable critical thinking and practical problem-solving. To achieve the objective, the science instructors on the ground should implement the following: classroom, the instructor must to engage in more practical exercises, inquiry-based learning, and problem centered on "learning by doing" exercises. Participants [8, 17, and 20] laid out their insights about honing their mastery in science concepts into hands-on practical skills. Participant 8 elucidated, *“Hands-on activities given by our science teacher made us more aware and improve our skills. It is very important that science concepts must be applied in practical activities to gain more practical skills and become ready for future careers.” (P8).* Abulibdeh and Shana recommended that hands-on training is offered for majority of the ideas in biology and chemistry, as they are regarded as an applied science. A few ideas cannot be comprehended without practical application. Furthermore, some ideas are not applicable, therefore further investigation is required to

streamline scientific ideas in general, and simplify biology and chemistry and especially more fascinating topics. This may be beneficial, students gain motivation, put forth more effort, and comprehend biology and chemistry more effectively. A further one, participant 17 expound that, *“I keep motivated during learning activities that are more on hands-on because it can create a positive outcome such as enhanced psychomotor skills, in doing such activities in science subject, it is not just only the hands that works but also the mind and the heart, it improves my knowledge and appreciating its application.” (P17).* Ghosh described that in order to address the increasing lack of young people thinking about a career in the sciences, we need to start cultivating curiosity at a young age to put them on an academic path to STEM subjects. We also need to introduce a hands-on, hands-on approach in cultural institutions and educate the next generation through engagement and inquiry. Furthermore, participant 20 stated that, *“Sometimes, we struggle to do hands-on activities because of the availability of materials. Our school do not have sufficient functional laboratory equipment that is why our science teacher and even us students become resourceful just to continue the hands-on activities to gain more practical skills where we can apply in real-life setting.” (P20).* Macayana and Mangarin showed that the underlying reasons why public schools in the Philippines lack of science labs and equipment is costly, limitations, little funding, poor management and use of money. Equipment and labs for science are essential for promoting scientific knowledge and useful pupils' abilities, as well as assisting advanced development and research. Summarizing the insights from student respondents of this study as they are considered as the heart of education, the effectiveness of the motivational practices of junior science teachers can also be assessed by the ones who received it, the students. Learners who are exposed in different learning tasks tends to be more curious and engaged in classroom discussion and activities. Through utilizing performance tasks in science, the learners have deep appreciation and its application in their everyday life that could resulted improved performances. To educators, feedback is essential to be given to all types of learners about their academic performances for it motivates them to go forward in their studies and empowers them to become knowledgeable and equipped critically and creatively. Careful feedback must also consider because there are learners who become affected negatively, comments and suggestions must be in constructive form. The impact of science concepts through hands-on practical activities is also crucial in developing and enhancing the skills of the students. However, there are still instances that teachers and students struggled to do hands-on activities due to lack of materials, and to increase the amount of learning useful and significant, prepared for future endeavors, the government and stakeholders should support the needs of the school. This balanced cooperation can make a positive change in the communities and can produce a more productive learning environment.

➤ *Challenges Encountered by Science Teachers in Motivating Learners*

Table 3. Challenges Encountered by Science Teachers in Motivating Learners

Indicators	Weighted Mean	Description
Highly diverse learners' attitudes and behaviors	3.84	Serious
Learners' difficulty to use and comprehend English being the medium of the subject	3.80	Serious
Learners limited conceptual and procedural understanding in science	3.68	Serious
Inadequate laboratory facilities, apparatus essential for laboratory experiments	3.64	Serious
The curriculum is congested	3.40	Moderately Serious
The time intended for science instruction is limited	3.36	Moderately Serious
Lack of experience and training to effectively handle diverse learners	3.17	Moderately Serious
Some learners are passive in science	3.08	Moderately Serious
Some learners struggle to connect classroom learning with the real-world events	3.04	Moderately Serious
Average	3.45	Moderately Serious

Table 3.0 shows the challenges encountered by junior science teachers in shows the difficulties faced by junior science instructors in inspiring students within the district of Juban. The difficulties faced by junior teachers of science in inspiring students critically important to address because they directly shape student engagement, academic outcomes, and long-term interest in science subjects. The overall mean of the challenges encountered by junior science teachers is 3.45, described as moderately serious.

Highly diverse learners' attitudes and behaviors have a mean value of 3.84 considered as serious challenge encountered by junior science teachers. The diverse attitudes and behaviors of learners are a critical, often overlooked, root factor shaping the challenges junior science teachers face. Its influence extends beyond day-to-day classroom management to impact lesson design, student engagement, and teacher well-being. Aydin stated that teachers are assigned to classrooms with pupils from diverse backgrounds, cultures, and viewpoints. For educators who are ill-prepared to work with diverse student populations, these pupils' particular demands present a major obstacle. Serving children from a variety of backgrounds can be difficult for teachers, and these students run the danger of becoming positioned in courses where they won't have their fulfilled their academic and personal demands, impeding their capacity to to participate actively and contribute to society. Anto, et. al. elaborated that despite several obstacles, the teachers showed tenacity and ingenuity in discovering creative methods to provide excellent science education. The educators are hoping for some assistance and advancements in science education to instruct and generate excellent science instruction.

Next challenge encountered by junior science teachers is learners' difficulty to use and comprehend English being the medium of the subject with mean value of 3.80 considered as serious challenge. Alanazi explained that learners' difficulty using and comprehending English as the teaching language in science is pervasive, high-stakes

challenge for teachers – especially in multilingual regions such as Bicol, where many students speak Bicolano or other languages as their first language. Accomplishment in learning English as although a second language is unique, at first, both teachers and students need to face the difficulties that arrive in their path. Getting acquainted with new instruction techniques and practicing extensively outside the classrooms are great means of overcoming the challenge. of the dialect that native speakers use. Comprehending the English language's norms through simplified techniques, in addition to extensive training and practice in writing correctly is essential to learning the grammar of the target language. learners ought to understand the sufficient vocabulary needed to become proficient the language, how to employ it efficiently, and that this procedure cannot go swiftly; it takes a significant length of time. Bhattarai added that involvement of students in classrooms using English as a Medium of Instruction (EMI) appears to be influenced by the kids' multicultural and backdrops that are bilingual, with some expressing discomfort when taking part in class activities even though it is discovered that they are content with the successes and opportunities brought about by EMI-based school. Other strategies, such bilingual education initiatives, striking a balance between the need to learn English with preserving pupils' ties to their native culture and language are important. By looking at the difficulties and opportunities of EMI in rural areas, the research can help create more efficient methods of instruction that support both English Learning language and achieving academic success for every student, irrespective of their background.

Another serious challenge encountered by junior science teachers is learners limited conceptual and procedural understanding in science with mean value of 3.68. One of the key challenges science teachers faces is bridging the gap between learners limited conceptual (understanding “why” science works) and procedural (mastering “how” to apply science skills) knowledge. It is important to recognize this limited understanding because acknowledging learners' restricted conceptual and procedural grasp is critical for effective teaching, it helps teachers design interventions, enhances deep learning by addressing the gaps, building scientific literacy, and reduces achievement inequity by identifying and supporting struggling learners.

Belbekkai and Omrane mentioned that it should be noted that the learning of scientific concepts holds great importance, as it helps learners enhance their understanding of scientific subjects, tackle problems, and reduces the need for relearning when faced with a similar new situation. Scientific concepts also play a role in organizing experiences, constructing principles and generalizations, as they represent the mental structures that assist learners in identifying relationships between various facts. Educators emphasize the importance of scientific concepts, as they facilitate the learners' understanding of science clearly. The clarity of concepts and terms is essential for understanding, comprehension, and achieving scientific communication.

Calzada and Remperas emphasized that investigating the long-term effects of these obstacles and tactics for pupils' academic performance and participation in the teaching of science. The results highlight the necessity of systemic changes, like as increased financing for lab facilities, programs for professional development to enhance curricular alignment and instructors' competencies to guarantee a smooth transition between theoretical and practical parts. Inadequate laboratory facilities, apparatus essential for laboratory experiments is also a serious challenge experienced by junior science teachers with mean value of 3.64. A high-impact challenge for science teachers is the lack of sufficient, functional laboratory facilities and essential apparatus, this gap undermines hands-on learning. Inadequate functional laboratory facilities and equipment compromised procedural mastery, limits conceptual clarity, compromised safety risks to safety, and it reduced engagement of learners. Addressing this gap can create effective science education which results to scientific literacy, equity, and aligned with curriculum standards suited for learners.

Calzada and Remperas emphasized the best practices for putting the Laboratory-Based Teaching Approach, (1) resourcefulness and in lab exercises, spontaneity is essential for improving high school science instruction, especially in settings with limited resources. The incorporation of homemade materials not only makes up for the absence of a conventional laboratory equipment, but it also encourages active learning and involvement of students. This strategy has been demonstrated to greatly enhance student performance and comprehension in science courses, (2) cooperation in teaching and learning, tackling issues in the effectiveness of laboratory instruction frequently depends on the cooperation. Teachers collaborated with their coworkers, combining resources like tools and resources to improve the educational chances for children, in a similar vein, peer mentorship in student organizations promoted a helpful classroom setting, enabling classmates to help each other. This strategy not only improved student involvement while simultaneously easing the supervisory duties of educators, allowing them to concentrate on more general educational objectives, and (3) time management, effective time management is essential to effectively completing laboratory tasks within science courses in high school. It enables both pupils to helping educators to maximize the frequently scarce times set aside for practical experimentation, allowing a deeper investigation of scientific concepts and procedures. By encouraging methods that prioritize activities, uphold organization, prudent use of resources, and effective time management does more than just expedite lab sessions but also establishes the foundation for better academic performance.

A further challenge encountered to note by junior science teachers is the curriculum is congested with mean value of 3.40, with description of moderately serious. A system-level challenge for science teachers is managing overcrowded, content-heavy curricula – an issue amplified in contexts like the Philippines K to 12 Curriculum, where broad topic coverage often prioritizes quantity over depth.

However, tackling overcrowded science curricula is critical because it deepens learning allowing teachers to prioritize critical concepts and skills that build long-term scientific literacy, restores hands-on practice, flexible curricula enable teachers to tailor lessons to their students' needs, reducing teacher burnout, and ensures learners, regardless of background, have the time to grasp foundational ideas before advancing.

Solomo discussed that the vast majority of DepEd Science students had excellent proficiency in Earth Science and Biology, as well as good proficiency in Physics and Chemistry. They still need to improve their comprehension of a few physics and chemical ideas, though. possessed excellent pedagogical understanding in terms of lesson design, the art of questioning, and teaching delivery; yet, they ought to offer empowering and cooperative activities to help students develop their critical thinking abilities. Diquito promoted that the curriculum reform is necessary in order to address the community's, the countries, and worldwide demands. In doing so, members of the community are possessing pertinent abilities and proficiencies that are current and pertinent in the contemporary era. K–10 or in the Philippines, MATATAG Curriculum is the recently developed the nation's curriculum. The purpose of this the goal of change was to create capable students. that is resilient, adaptable to global demands, and able to adjust to change. The overall goal of this reform focuses on advancing science, the environment, engineering and technology literacy of students in the nation. By emphasizing these literacy skills, the Philippines seeks to receive a top-notch science education.

The next key consideration is the time intended for science instruction is limited with mean value of 3.36, moderately serious. Kolbe et. Al. discussed that the compounding challenge for science teachers is the scarcity of dedicated instruction time, which amplifies existing hurdles like congested curricula and inadequate labs. Resolving time scarcity is crucial because it enables inquiry-based activities and concept reinforcement, and dedicated time for remediation for students to have equal access to foundational science skills. The degree to which scientific instructors employed using inquiry-based teaching methods was connected to how much time there was for science. guidance. Teachers who work five or more hours a week were more inclined to employ inquiry-based teaching procedures, as well as the degree to which educators participated in science education focused on change grew with more it's instruction time. The connection between teacher practice and instructional time were mostly regardless of a teacher's credentials, indicating that regardless of a teacher's experience or educational background, instructional time has an impact on their instructional practice or experience instructing science.

Bektas and Oguz examined in their study that perhaps educators ought to take action to reduce non-academic time in order to make use of it efficiently in the classroom. To sum up, the practice in science classes, scientific investigation ought to be conducted. in a manner that gives

each step enough time. Despite the challenges it presents for educators, it's an unquestionably, scientific research is an efficient method in teaching science, since people, by nature, are more likely to acquire knowledge through scientific investigation more than any other method. Following this is lack of experience and training to effectively handle diverse learners with mean value of 3.17, with description of moderately serious. Casal and Villocino reviewed that in science education, it is crucial to invest in training and experience-building for different learners. Teachers must attend seminars and workshops to stay up to date on the latest methods, techniques, and trends for working with various student types. The results highlight the significance of creating a helpful, conducive classroom, the assistance of parents and stakeholders, and cooperative workplace where educators are with the resources and instruments required to oversee varied classes in an efficient manner. By acknowledging the dedication to these duties, educational institutions, and legislators can take significant action to generate essential supplies, tools, and other resources to assist in inclusive education, educators should be effective and strengthen their career development. Based on the posted educational blog of Richard Rogers, he described that the diversity in the classroom is a great way to teach students about the vastness of the world we live in. Students learn to accept diversity on a personal, regional, national, and worldwide scale when they are exposed to the size of the globe we live in. Additionally, they achieve better knowledge and abilities. However, educators must demonstrate outstanding general behavior control abilities, and maintain regular contact with line, phase, and supervisors, upper management, school counselors, and even parents to collect data and react suitably to what could end up being a variety of changing circumstances.

Another pivotal challenge encountered by junior science teachers is some learners are passive in science with mean value of 3.08 (moderately serious). Managing passive learner behavior in science is also a persistent classroom challenge experienced by science teachers. This passivity manifests passive learners rely on memorizing textbook definitions instead of asking questions, avoid group works, class discussions, or interactive learning activities and results to missing opportunities to build procedural skills, and explicit answers instead of exploring solutions. Ang cited that schools must move toward active learning, in which pupils participate in the process rather than only being its beneficiaries. Role-playing, debates, group discussions, real-world tasks, and project-based learning ought to be the norm rather than the exception. Students should be encouraged to talk, challenge, reflect, and investigate, and teachers should be given the resources they need to achieve this change rather than being chastised. Silence must no longer be viewed as a sign of achievement in Philippine education. Thinkers, not recorders, are what the future demands. Students must be given the opportunity to learn aloud before we can expect them to take the lead. Goel believed that while passive learning techniques like lectures offer a methodical way to communicate information, they frequently result in superficial comprehension and low level of student participation. The

absence of active engagement and practical experiences could impede students' capacity to acquire critical thinking abilities, problem-solving skills, as well as profound intellectual comprehension.

A subsequent finding of this study about challenges encountered by junior science teachers is some learners struggle to connect classroom learning with the real-world events with mean value of 3.04, considered as moderately serious. Buban showed in his study that students concur that vocabulary related to science is difficult. Performing calculations and reading paragraphs are challenging, but children like the teachers' explanations and examples to better comprehend the lesson. Additionally, the lesson is comprehended if it is connected to everyday actions, which indicates that the pupils understand the significance of what is instructed in a classroom. This might imply that contextualization and localization of actions as well as the lesson itself has an impact on students' comprehension of scientific ideas.

Buban considered the results of the study, listed are some recommendations, (1) engage in reading sessions utilizing science texts, a few opening phrases or a single paragraph will be plenty. This should advance based on the enhancement of the learner, (2) reading in English can be integrated sessions where science-related reading materials are used text, (3) offer mathematical exercises such as the conversion of units, taking measures, recognizing provided and unknown in an issue and the interpretation of a graph. Before the discussion of the planned lesson for the day, this is done gradually to condition the students' minds and help them acquire the ability through repeated exercises (4) collaboration with math instructors on mathematical activities in science to complete the assignment, (5) offer science terms at the beginning of each subject, (6) localize and contextualize the pupils' learning assignments to connect education to everyday tasks, (7) educators to give other examples, justifications, and other techniques to help pupils comprehend the material, (8) students take pleasure in experiments that let them examine and document what they have seen.

Ali and Di Jager analyzed that to enable students to become scientifically literate people who can make knowledgeable decisions on matters pertaining to their individual life, society, and the global community. The science's daily necessity and its relevance to all societal decisions cannot be overemphasized. Learning through direct interaction is a crucial component of experiential learning, according to the Experiential Learning blog for Innovative Education Ideas for K-12 as opposed to merely taking in information. If at all feasible, include authentic learning opportunities in your curriculum so that students may actively engage with the pertinent, real-world topics they are learning. This is a crucial component of experiential learning because it allows students to relate real-world subjects that have personal significance and influence.

➤ *Proposed Innovative Teaching Practices to Improve the Interest of Learners in Science*

Adlaon and Laid discussed that for science education to change in the twenty-first century, creative teaching methods are crucial. Methods including technological integration, hands-on learning, and student-centered education have shown notable potential to improve understanding, drive, and learner independence. Student-focused methods, which provide student autonomy and customization top priority, further encourage students to take charge of their education and innate curiosity of science. By accepting and honing creative methods of instruction, teachers can more effectively equip pupils to handle the demands of a quickly changing landscape of science and technology.

• *Rationale:*

Saro et. al. innovative teaching techniques and the incorporation of technology are driving a major revolution in science education in the Philippines. The country's dedication to producing scientifically informed people who can prosper in a world that is always evolving is what is driving this change. Students' engagement with science has undergone a paradigm shift as a result of the integration of technology and adaptive teaching methods. They are now eager explorers rather than merely passive consumers of knowledge and critical thinkers, participating in interactive simulations, and working together on actual research projects. Calo and De Vera insightful perspectives on current initiatives to enhance science education in the Philippines, highlighting the need to address systemic problems in order to support a more efficient, fair, and fulfilling educational experience for every student. Escuzar emphasized that an increased degree of involvement encourages a sincere love of science that goes beyond the classroom and encourages lifelong learning. To do this, effective teaching techniques need to be at the forefront of reform and practice of scientific education. Paguio stressed that that in a daring attempt to enhance the standard of elementary education, the Department of Education (DepEd) unveiled the MATATAG Curriculum, a reorganized framework for education that redefines the teaching of fundamental disciplines like science in Philippine educational institutions. This reform's main objective is to shift away from broad content and rote memorization heading in the direction of giving students a more in-depth, inquiry-based educational experience. A revolutionary approach to science education, the MATATAG Curriculum prioritizes comprehension over memorization and inquiry over instruction. By the integrating inquiry and critical thinking into science education, in practical setting, it seeks to generate learners who are both scientifically and intellectually capable socially conscious and inquisitive. With consistent instruction for educators, community assistance, and a learner-centered philosophy, a new generation might be raised in the Philippines ready to prosper in a world that is becoming more and more shaped by technology and science.

Abejar explained that students gain more knowledge about science as a field of study and as a means of inquiry by engaging in relevant and useful activities. Teachers who

employ this strategy assist pupils in developing into capable, self-sufficient learners ready for the the difficulties of the modern world. According to the Teachers Institute, planning is the act of creating a thorough plan that describes the teaching and learning objectives, techniques, and assessments for a specific subject's theme or topic. Within the framework in science instruction, a unit plan acts as a guide for how an instructor will present, investigate, and solidify scientific ideas throughout several classes. It guarantees that every lesson adds to a comprehensive education experience, promoting continuity, and expanding upon prior knowledge in a methodical, logical way. Unit planning's importance in science education cannot be emphasized, and the reasons it is so important include as follows: (1) guarantees continuity and coherence; (2) increases student interest; (3) offers a clear roadmap; and (4) encourages efficient evaluation.

The proposed innovative teaching practices in science along with strategic teaching framework are designed using the knowledge gained from this research and from previous research and publications. These innovative teaching practices and strategic teaching framework in science are designed to empower learners and enhance students' interest in learning the science as a subject, resulting to improve performances, and ready for future careers and success. The proposed plan involves the teaching practices employed by science teachers as innovative strategic teaching practices, objectives, teaching methods such as student-centered approaches, proposed outcome, the feedback, and monitoring.

• *Goals*

- ✓ To design a flexible and locally rooted innovative strategic teaching framework that triggers intrinsic (self-driven) and extrinsic (contextual) motivation in science learners, leading to higher and long-term participation in science-related activities.
- ✓ To empower learners in enhancing the interest in science and create a positive learning environment where every learner is involved and included.
- ✓ To strengthen the professional skills of science teachers with adaptable and learner-centered practices that enable to implement innovative and relevant instruction.

V. CONCLUSION AND RECOMMENDATIONS

Based on the findings of this study, the following conclusions are drawn;

- Integrating technology is the most frequently employed motivational practice of junior high school science teachers within the Juban District in improving the interest of learners towards science.
- The level of effectiveness of the motivational practices employed by junior high school science teachers is effective.
- The learner's assessment of motivational practices indicated that providing varied learning activities increased the curiosity and engagement of learners, recognized the relevance of science into everyday life, improved performances, accepted constructive criticisms

from science teachers, and honed mastery of science concepts into practical hands-on skills.

- The challenges encountered by junior high school science teachers in motivating learners is moderately serious.
- Innovative teaching practices with strategic teaching framework can be proposed to improve the interest of learners in science and to ensure effective learning environment.

Based on the findings collected and the conclusions formulated, the following are the researcher's recommendations:

- Providing technological tools for technology integration in science classes to increase the interest of learners be strengthened.
- Motivational practices employed by science teachers in science classes be sustained.
- Learners' participation in assessment of motivational practices applied by science teachers be highly recognized.
- In addressing the challenges encountered by science teachers in motivating learners, providing seminars, workshops, and trainings including wellness break be supported.
- Informative, empowering, and innovative strategic teaching practices in motivating learners in science be proposed and developed.
- This research study be the guide for the future researchers.

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