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Learners' Engagement and Their Performance Skills in Science in West District Schools of Cagayan De Oro City Division

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ABSTRACT

Learners' engagement is vital for academic success and personal growth in science education, fostering critical thinking and understanding of the natural world. This study examined the engagement levels and science performance skills of Grade 5 pupils in West District Schools, Cagayan de Oro City, for School Year 2024-2025. Engagement was assessed across affective-emotional, cognitive, and behavioral dimensions, while performance skills were evaluated in remembering, understanding, applying, analyzing, evaluating, and creating. Using a descriptive-correlational survey, data were analyzed with descriptive and inferential statistics, including Pearson's Product Moment Correlation. Findings revealed high emotional engagement but lower cognitive engagement among learners. Performance skills were strongest in evaluating tasks (critical thinking) and weakest in memory-related tasks. A significant positive correlation was identified between cognitive engagement and performance skills, whereas behavioral engagement showed a weaker correlation. The study underscores the importance of emotional and cognitive engagement in science performance. Recommendations include integrating cognitively challenging tasks, employing memory-enhancing techniques, and promoting activities linking behavioral engagement to real-world science applications to improve performance. Teachers are encouraged to create meaningful learning experiences that enhance engagement and foster comprehensive skill development in science.

INTRODUCTION

Learners' engagement is one of the important constructs that is used to understand the behavior of the student towards the teaching-learning process. Engagement and performance are necessary in Science subject for the academic success and personal growth of students. However, teachers often face difficulties that hinder their ability to engage and involve students in the learning process fully. Herman *et al.* (2018) found that teachers' well-being directly affects student engagement, with well-supported teachers fostering more engaged Science students.

The researcher is a Science teacher in an elementary school, and she encountered issues with children not participating in class. Even though students may show eagerness for Science-related activities at first, it can be hard to keep them attentive and concerned. In order to help the students realize their full potential, it is crucial to identify structured techniques to maintain their interest and involvement in Science. Understanding how participation impacts learning results is important, especially in Science. Because it pursues an awareness of the environment and critical thinking abilities, it is a foundational subject in education.

This study defined learner engagement in three (3) distinct domains: affective-emotional engagement, including attitudes, interest, and sense of belonging; cognitive engagement, including persistence, willingness, and motivation and behavioral engagement, including participation in activities (Fredricks *et al.* 2004). Fredricks' comprehensive framework highlights the multifaceted nature of engagement, emphasizing that fostering student engagement requires addressing all three dimensions to support students' overall academic success and well-being. Also, the 21st-century classroom emphasizes a holistic approach to engagement, encompassing emotional, cognitive, and behavioral aspects (Karafil & Oguz, 2019). Teacher factors, as highlighted by Delfino (2019), significantly influence engagement.

As emphasized by Reeve and Tseng (2021), student engagement is a multidimensional construct that encompasses behavioral, emotional, and cognitive involvement in learning activities. Engagement becomes even more crucial as the subject often requires active participation, critical thinking, and problem-solving skills. When students are actively engaged, they tend to develop a more profound understanding of scientific concepts and theories (Park & Johnson, 2020). Furthermore, engagement is strongly associated with students' attitudes toward science, which subsequently influences their academic performance.

Meanwhile, a meta-analysis by Reeve *et al.* (2024) found a strong positive relationship between student engagement and academic performance. In the context of science education, engagement has been associated with improved grades, better test scores, and higher levels of concept retention. Regardless of the pedagogical techniques used, students' engagement and satisfaction with the learning

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process are of utmost importance. Learners' engagement is the energy and effort they devote while interacting with the learning process (Bond, 2020; Khlaif *et al.*, 2021). It basically shows the level of students' involvement with the learning environment. Positive and effective learning gains are almost impossible to achieve if students are not actively engaged with and feel displeased with the learning environment.

In conclusion, learners' engagement and its influence on performance skills in Science for Grade 5 students plays a pivotal role in Science education and skill development. Students form foundational attitudes toward science at this stage, which can shape their future interest and success in the subject. Research consistently highlights that high engagement, especially emotional and behavioral, is associated with greater motivation, persistence, and academic success (Pöysä *et al.*, 2018). Examining how engagement impacts Grade 5 students' performance skills across cognitive processes such as remembering, understanding, applying, analyzing, evaluating, and creating. These skills, often associated with Bloom's Taxonomy, provide a structured framework for assessing students' depth of knowledge and their ability to apply it in practical, real-world scenarios. This study can provide valuable insights into teaching strategies that foster a deeper understanding and enthusiasm for science, ultimately aiming to improve long-term educational outcomes in this essential subject area.

LITERATURE REVIEW

Learners' Engagement

Learners' engagement referred to the level of determination and commitment that students had for their education and learning. It comprises how much each student participates in class activities, pays attention to details and has an interest in the material, and how deeply they process the information. Various forms of engagement exist, including affective-emotional, cognitive engagement, and behavioral engagement. This review of literature explores the interplay between the learner's engagement and their performance skills in Science. Examining the existing literature and studies, it offers a significant correlation of student engagement.

Fitzgerald and Palincsar (2019) explored teaching practices that support student sensemaking across grades and disciplines. They highlighted strategies such as collaborative learning and project-based approaches to enhance engagement in elementary science. Learners' engagement refers to the degree of involvement, interest, and enthusiasm that students demonstrate towards their learning activities. Numerous studies have investigated the relationship between student engagement and academic performance in various subject areas, including Science (Bond *et al.*, 2020). The role of dynamic presentation techniques and the use of real-world content to keep student engagement high in Science. Strategies included interactive activities and the integration of current events into lessons (Fostering Engagement Through Content and Presentation, 2020).

Moreover, promoting active and collaborative learning through project-based and inquiry learning was shown to transform students into critical thinkers and problem solvers. This approach was particularly effective in engaging students in elementary Science (Project-Based and Inquiry Learning, 2020). Also, Panulaya (2023) stated that teachers acknowledge that learning is a circular process and that, in addition to studying specific topics and subject matter, students should also learn how to reflect on their learning and acquire knowledge about their learning processes.

Several studies have found a positive correlation between student engagement and performance in Science. A study by Fredricks *et al.* (2020) found that students who were more engaged in their Science classes tended to have higher academic achievement. Similarly, another study by Wang and Eccles (2020) showed that students who exhibited higher levels of engagement in Science were more likely to perform better in the subject. A considerable amount of literature has been published on engagement. These studies have, however, mainly focused on overall engagement, cognitive, behavioral, or emotional engagement in regular classrooms at the undergraduate level (McKellar *et al.*, 2020; Bond *et al.*, 2020).

Moreover, learners' engagement has been linked to a range of positive outcomes beyond just academic performance. For instance, engaged students are more likely to demonstrate critical thinking skills, problem-solving abilities, and a deeper understanding of scientific concepts. This suggests that fostering student engagement in science leads to improved academic outcomes and contributes to the development of essential skills and competencies that are valuable for future success in the field.

In addition to academic achievement and skill development, learners' engagement in science has also been associated with increased motivation, a more positive attitude toward the subject, and a greater likelihood of pursuing further education or careers in Science-related fields. This highlights the importance of implementing strategies to enhance student engagement in science education, as it can have far-reaching effects on students' overall learning experiences and prospects. The literature suggests that there is a positive relationship between student engagement and performance in Science. Students who are emotionally engaged are more likely to exhibit higher behavioral and cognitive engagement levels (Fredricks *et al.*, 2020). Similar studies by Pöysä *et al.* (2018) highlighted how emotional and cognitive engagement in science leads to better retention of information, higher motivation, and enhanced performance.

Hence, it is important for educators and researchers to continue exploring and understanding the factors that contribute to learners' engagement in Science. By studying the various dimensions of student engagement, such as behavioral, emotional, and cognitive

engagement, educators can gain insights into effective teaching strategies and interventions promoting student engagement in Science.

Affective Engagement

Affective engagement is the emotional reactions and feelings that individuals experience about their learning environment, activities, and interactions. It encompasses positive and negative emotions and is crucial in shaping an individual's overall engagement with a particular context or task. Affective or emotional engagement is one of the dimensions of student engagement and refers to students' emotional reactions in the classroom, including interest, boredom, happiness, sadness, and anxiety. Emotional engagement is essential because it encompasses the feelings that can significantly influence a student's motivation to learn and their connection to the subject matter, ultimately impacting academic performance. Attard *et al.* (2020) examined how emotions such as enjoyment, curiosity, and even boredom influence students' participation in Science education. Positive emotions are shown to significantly enhance both interest and deeper engagement with the subject matter. Pöysä *et al.* (2018) found that students' emotional engagement, including positive affective responses like enthusiasm, pride, and interest, significantly correlates with better academic performance, primarily when these emotions are cultivated within supportive learning environments.

Attitudes

Reeve (2018) discussed the importance of student engagement in the learning process, particularly emphasizing the role of the affective domain in fostering a positive attitude toward learning. According to Reeve, engagement is a multidimensional construct that includes behavioral, emotional, and cognitive dimensions crucial for effective learning. The affective domain, which encompasses students' emotions and attitudes, plays a critical role in their overall engagement and motivation. On the same line, Cook (2018) explored the impact of teacher-student relationships on student engagement and effective outcomes. It emphasized the importance of positive teacher-student interactions in enhancing students' emotional and attitudinal engagement in Science classes.

Interest

Interest in student engagement refers to the level of curiosity, motivation, and emotional involvement students have in their learning experiences. In the affective domain, interest is crucial in influencing students' attitudes, values, and beliefs about the subject matter. Interest in student engagement is important for promoting a love of learning, intrinsic motivation, and a positive attitude toward education. The study by Kang and Keinonen (2024) highlighted how student-centered approaches like inquiry-based and discussion-based learning affect students' interest and achievement in Science. It emphasized the role of relevant, open-ended inquiries in maintaining student interest. Since students have lost interest in Science, student-centered approaches, such as using topics that are relevant for students, inquiry-based learning, and discussion-based learning, have been implemented to attract pupils to Science. A research article by Reeve (2018) explored the importance of the affective domain in education, emphasizing how student emotions and motivations play a critical role in engagement and learning. He states that students' emotional experiences in the classroom significantly influence their engagement and learning outcomes, highlighting the need for educators to create supportive and motivating environments.

Sense of Belonging

Fostering a strong sense of belonging among learners is pivotal for their affective engagement with Science. A sense of belonging, defined as the subjective experience of feeling connected to and valued within a given environment, can significantly impact student performance and motivation in science. Learners who feel a strong sense of belonging are more likely to be actively engaged, emotionally invested, and enthusiastic about their scientific studies. According to Allen (2018), school belonging is intricately tied to student-teacher relationships and the overall school environment. Effective discipline, teacher support, and the presence of good friends were identified as key components that foster a sense of belonging, which can significantly influence students' engagement and success in subjects like Science. Fostering a sense of belonging in school involves acknowledging and addressing students' individual needs and challenges. By creating a supportive environment where students feel accepted and valued, educators can enhance students' engagement and interest in learning.

Cognitive Engagement

Cognitive engagement mentioned the extent of students' investment in their learning, which includes their willingness to engage in complex, challenging work and their use of deep learning strategies such as self-regulation, critical thinking, and metacognition. This type of engagement is associated with a student's desire to go beyond the minimum requirements and truly understand the material. Cognitive engagement is closely linked to educational strategies that promote higher-order thinking skills and inquiry-based learning, both of which are critical in Science education. As quoted by Kamarrudin (2023), cognitive engagement encompasses the mental processes and strategies that students employ during learning activities. It involves the level of attention, effort, and investment that students devote to understanding and mastering the content (Liang *et al.*, 2018).

Likewise, Gundaya (2023) found that critical thinking allows students to process information logically and prepare themselves for self-directed learning. Students with critical thinking skills can determine what information is important and what is irrelevant or not

useful. With critical thinking skills, students can also weigh various facts and points of view and identify logical errors, thus helping to solve problems.

Persistence

Persistence is the ability of students to persevere and continue their efforts in learning tasks despite facing challenges or setbacks. It involves determination, resilience, and motivation to keep trying and not give up. According to Tai-Yen Chen (2020), student engagement persistence in the cognitive domain is crucial for academic success, as it involves the continuous effort and cognitive resources students invest in their learning tasks. On the same line, the study by Martin (2020) examined factors influencing student persistence in Science education, such as classroom environment, teacher support, and interactive learning activities. It emphasizes the role of cognitive engagement in sustaining students' interest and effort in learning Science.

Willingness

Willingness refers to students' inclination, readiness, and eagerness to actively participate in learning activities that require cognitive effort. It signifies their motivation, interest, and openness to engage in tasks that involve mental processes such as understanding, analyzing, and applying knowledge. Greene (2018) once said that cognitive engagement involves the investment in learning, willingness to exert the necessary effort for comprehension, and the application of learning strategies. Pietarinen *et al.* (2020) explored the determinants of students' emotional and cognitive engagement and found that positive emotional experiences in the classroom significantly enhance students' willingness to engage cognitively with Science content. The activities like environmental exploration promote students' willingness to engage with scientific concepts in real-world contexts. It suggests that such experiences help bridge the gap between academic science and practical applications, enhancing student interest and understanding of Science (Guerero & Reiss (2020).

Motivation

Motivation is the internal drive or desire that influences students to actively participate, learn, and persist in their educational pursuits (Shogren *et al.*, 2018). It enhances student engagement by promoting deep learning and the development of higher-order thinking skills. When students are motivated, they are more likely to set challenging goals, exert effort, and persevere through difficulties. The Cambridge Handbook of the Learning Sciences (2022) explores how motivation and cognitive engagement influence persistence in learning Science. It suggests a supportive learning environment and challenging tasks can enhance students' persistence.

Behavioral Engagement

Behavioral engagement concerns students' participation in academic, social, and extracurricular activities, which are crucial indicators of their involvement in their education. This dimension of engagement is often characterized by behaviors such as participation in classroom activities. The study demonstrates a strong link between behavioral engagement and student performance in Science. For instance, consistent involvement in Science classes and activities can lead to deeper understanding and retention of the material, which positively affects performance. Classroom participation is commonly associated with higher achievement since it reflects the students' commitment to learning, according to Marrone *et al.* (2018). Along with the study, Lei (2018) emphasized that engagement significantly influences learning outcomes and that different engagement strategies could enhance students' participation and performance in the subject.

Participation in Activities

Participation in activities is a key component of student engagement within the behavioral domain. It refers to students' active involvement and on-task behavior in various school-related tasks, events, and responsibilities. Ozer (2018) explored how participation in school-related activities influences students' behavioral engagement. He emphasized that students who actively participate in extracurricular and school-related activities exhibit higher levels of behavioral engagement, positively affecting their academic performance and school experience. The study by Lei (2018) mentioned that active participation in hands-on science activities significantly boosts students' engagement and overall learning outcomes. And the quality of teacher-student relationships impacts students' behavioral engagement in classroom activities.

However, performance skills refer to applying knowledge and learned concepts through hands-on activities. These skills emphasize the ability to demonstrate remembering, understanding, analyzing, applying, evaluating, and creating. Performance skills are essential in Science education, especially for students in Grade 5, as they go beyond simple memorizing and promote critical thinking, experimentation, teamwork, and real-world application.

Remembering

Remembering is the most basic level of cognitive processes. It involves the ability to recall facts, terms, basic concepts, or answers without necessarily understanding their deeper meaning. This stage focuses on the retrieval of relevant knowledge from long-term memory (Krathwohl, 2018). Strategies for improving remembering include using flashcards, mnemonic devices, and regular quizzes to reinforce memory. Techniques for enhancing memory include recognizing and recalling important information through repeated practice and review.

Understanding

Understanding refers to the ability to grasp the meaning of information. It involves comprehending facts,

interpreting their significance, and explaining ideas or concepts. This level goes beyond memorization, allowing individuals to organize and describe knowledge in their own words, demonstrating an internalized comprehension of the material (Anderson & Krathwohl, 2018). According to the Centre for Teaching Excellence at the University of Waterloo (2024), the importance of the understanding stage is detailing how students move beyond simple recall to interpreting facts and explaining concepts. In the context of elementary Science, this might involve explaining how different types of clouds form or summarizing the main ideas behind a scientific process. It also provides practical activities such as discussions and problem-solving tasks to foster this level of comprehension. At the understanding stage, students are encouraged to interpret and explain scientific facts rather than merely stating them. For example, instead of just naming the parts of a plant, students might explain the functions of each part, thereby demonstrating a deeper comprehension of the subject matter. The resource highlights various questioning techniques and classroom activities to achieve this level of understanding (ThoughtCo, 2024).

Applying

Applying involves using learned material in new and concrete situations. This includes implementing knowledge through actions such as problem-solving, executing procedures, or using information in real-life scenarios. It suggests tasks such as demonstrating experiments, solving scientific problems, and using learned concepts in new and different contexts to ensure students can effectively apply their understanding in practical scenarios. These activities help students move beyond mere understanding to the practical application of their knowledge. In addition, Sharma and El-Amin (2018) discussed how applying can enhance the use of educational technology in classrooms by ensuring that technology integration reaches higher-order thinking skills. Also, Anderson and Krathwohl (2019) emphasized the importance of the applying stage in fostering deeper learning and comprehension. As mentioned by Fadel and Trilling (2020), to apply knowledge is a critical competency in modern education systems, aligning with Bloom's Taxonomy to prepare students for real-world challenges. This connects to the study of Newton and Winch (2021), which explores the application of Bloom's Taxonomy in higher education, specifically, how students apply theoretical knowledge in practical settings.

Analyzing

Analyzing is the stage where students use their judgment to begin analyzing the knowledge they have learned. They start understanding the underlying structure of knowledge and can distinguish between fact and opinion. This involves skills like analyzing, comparing, contrasting, differentiating, and illustrating (Kelly, 2019). Similarly, at the analysis level, students are encouraged to connect, compare, and contrast various concepts, which helps deepen their understanding of the material and prepares them for higher-order thinking and learning outcomes (Lee, 2024). Learning by Inquiry (2022) highlighted that during the analysis stage in inquiry-based learning, students must analyze the information they have collected to determine its relevance. Techniques like using graphic organizers and charts help students discern important elements and relationships within their research, fostering a deeper analytical skill set. Further, Ahshan (2021) developed a framework to enhance active student engagement in remote teaching during the pandemic. This highlights the effectiveness of combining educational technologies with active learning strategies to foster interaction and deeper understanding among students. Furthermore, Sudirtna (2022) investigated the impact of the revised Bloom's Taxonomy-oriented learning activities on students' metacognitive skills. His findings suggest that these activities significantly improve students' ability to engage in higher-order thinking and self-regulation.

Evaluating

The evaluation phase is important when it comes to teaching science in elementary school. Students are expected to evaluate the worth of concepts or resources at this level. Critical thinking abilities are required for this, including evaluating the veracity of information, contrasting and comparing various points of view, and defending conclusions with reference to norms and criteria. There are various ways to evaluate in Elementary Science. Pupils may be required to evaluate the validity of many sources of information regarding a scientific idea, contrast the efficacy of different experiments, or critically analyze the results of their own scientific research. Students who participate in these activities get the critical thinking skills necessary for scientific literacy—the ability to evaluate scientific knowledge. The evaluation phase is significant for helping students develop their critical thinking skills.

As mentioned by Lewis (2019), students assess the information they have learned to form judgments or opinions. Questions at this stage might ask students to argue, defend, or critique a scientific concept, encouraging deeper engagement with the material through critical thinking and decision-making. Moreover, the authority of the Center for Excellence in Learning and Teaching (2024) underscores the importance of the evaluating stage in the revised taxonomy, using verbs such as checking and critiquing to describe the cognitive processes involved. These activities help students in elementary Science to monitor and judge the quality of their work or the work of their peers, fostering a more dynamic and reflective learning environment.

Creating

The creating stage is particularly significant as it involves the synthesis of knowledge and the generation of new

concepts, items, or procedures. This stage encourages critical thinking, problem-solving, and creativity by combining elements in novel ways, planning experiments, designing models, and inventing solutions to scientific problems. This hands-on, inquiry-based approach aligns with contemporary educational goals and enhances scientific understanding. By incorporating the creating stage into curricula, educators can provide opportunities for open-ended exploration, project-based learning, collaborative activities, and the use of technology and digital tools. This approach nurtures young minds to become innovative thinkers and problem solvers (Widiana *et al.*, 2023). In the article of Valamis (2023), he discussed the significance of creating stage, highlighting its role in enabling students to generate new ideas, design projects, and produce original work. It emphasizes that creating requires students to put elements together to form a coherent or functional whole, which involves activities such as designing experiments, building models, or developing new solutions to scientific problems.

Additionally, Santa Clara University's (2020) article provides a detailed overview of Bloom's revised taxonomy and its application in education. It notes that the creating stage involves higher-order thinking skills where students not only use but transform their knowledge to produce something new. In the context of elementary science, this might involve students developing new ways to demonstrate scientific principles or creating multimedia presentations to explain complex concepts.

Statement of the Problem

This study aimed to determine the learners' engagement and their performance skills in Science in West District Schools of Cagayan de Oro City Division for the School Year 2024-2025. Particularly, this paper sought to answer the following questions:

1. What are the respondents' level of engagement in terms of affective-emotional: attitude, interest, sense of belonging; cognitive engagement: persistence, willingness, motivation and behavioral engagement: participation in activities?
2. How do the respondents assess their Science performance skills in the First Quarter based on remembering, understanding, applying, analyzing, evaluating, and creating?
3. Is there a significant relationship between student engagement and their performance skills in Science?

Theoretical Framework

This study was anchored on the Revised Bloom's Taxonomy by Bloom, Anderson and Krathwohl (2001). Benjamin Bloom's Theory, also known as Bloom's Taxonomy, is a widely recognized framework for describing different levels of cognitive learning. It categorizes learning objectives into six levels, starting from lower-order thinking skills, such as remembering and understanding, to higher-order thinking skills, such as analyzing, evaluating, and creating. When applied to the study of student engagement and their performance in Science, Bloom's Taxonomy can provide valuable insights. For instance, by considering the levels of Bloom's Taxonomy, educators can design science lessons and assessments that promote active engagement and deeper understanding among students. By incorporating activities and tasks that require students to apply their knowledge, analyze scientific concepts, evaluate evidence, and create their own experiments or explanations, educators can foster higher levels of student engagement and promote their overall performance in science.

In addition, Bloom's Taxonomy can also guide educators in differentiating instruction to meet the needs of diverse learners. By considering the different cognitive levels of Bloom's Taxonomy, educators can provide a range of activities and assessments that cater to students with varying abilities and interests in science. This approach can help ensure that all students are actively engaged and challenged in their learning, leading to improved performance in Science. Furthermore, this taxonomy can also inform the design of classroom environments that enhance student engagement and performance in Science. Educators can create a supportive and collaborative learning environment by incorporating activities that encourage students to collaborate, discuss, and apply their knowledge in real-world contexts.

Further, the Bloom's Taxonomy is highly relevant to the study of student engagement and their performance in Science as it provides a systematic approach for designing instruction and assessments that promote higher-order thinking skills and active engagement. Incorporating the different levels of Bloom's Taxonomy can greatly impact student engagement and performance in Science. Through Bloom's Taxonomy, educators have a comprehensive framework to evaluate and design tasks that promote higher levels of student engagement in science.

Overall, Bloom's Theory provides a framework that can guide educators in promoting learners' engagement and enhancing performance in Science. Educators can structure their science lessons and assessments by utilizing the different levels to encourage higher-order thinking skills and active engagement. By doing so, students are more likely to develop a deep understanding of scientific concepts and be able to apply their knowledge in meaningful ways.

Limitations

This study focused on the Learners' Engagement and their Performance Skills in Science for the First Quarter in West District Schools in Division of Cagayan de Oro City .Furthermore, it was limited to learners' engagement, which includes affective engagement, cognitive engagement and behavioral engagement as the independent variables. Meanwhile, it is also limited to their performance skills in remembering, understanding, applying, analyzing, evaluating, and creating. The respondents of this study were pupils in four (4) West District Schools of the Division of Cagayan de Oro City.

The study involved the perceptions of pupils, and this was examined using a tool to identify the three components of student engagement.

MATERIALS AND METHODS

Research Design

In this study, the researcher used a descriptive-correlational survey method. In this design, data were collected to investigate the relationship between the variables. This method helped in gathering, tabulating, and computation of data after which they were analyzed and interpreted. According to Creswell (2012), correlation research is a statistical test to determine the tendency or pattern for two even variables or two sets of data to vary consistently. The purpose of correlational research is to determine the relationship among two or more variables.

Study Setting

This research study was conducted in the West District of Cagayan de Oro City, encompassing the 1st Congressional District, which is characterized by a mix of urban and rural environments. It is a large city in the Northern Mindanao region of the Philippines. It is the capital of the Misamis Oriental province and is known as the city of Golden Friendship, where people are friendly and hospitable. In the 2020 census, it has 728, 402 people lived in the city. Cagayan de Oro is also the center of business in Northern Mindanao. It is subdivided into 80 barangays. These are grouped into two congressional districts, 24 barangays in the 1st district (West) and 56 barangays in the 2nd district (East), with Cagayan de Oro River as the natural boundary. The city has 57 urbanized barangays and 23 rural barangays all in all. Under West district are: Baikingon, Balulang, Bayabas, Bayanga, Besigan, Bonbon, Bulua, Canitoan, Carmen, Dansolihon, Iponan, Kauswagan, Lumbia, Mambuaya, Pagalungan, Pagatpat, Patag, Pigsag-an, San Simon, Taglimao, Tagpangi, Tignapoloan, Tuburan, Tumpagon. This area is home to a diverse population, including the city's old-money families residing in traditional houses and modern subdivisions. The district also accommodates a significant portion of the city's industrial and commercial activities, contributing to its economic growth. West District is known for its peaceful environment, making it a desirable place to live for those seeking a respite from the city's hustle and bustle.

Additionally, West District embodies the vision of the Department of Education to produce functionally literate Filipinos. It has a cooperative and supportive community, which also helps the schools in the district to be at their best in overcoming different challenges. It is one of the most trusted in the Division of Cagayan de Oro City that provides quality basic education as evidenced by a participation rate of more than a hundred percent and the several academic and non-academic achievements bagged by its schools every year. The researcher chose West District since it is her hometown and is currently stationed at West I District, Cagayan de Oro City, where all the needed data is accessible.

Study Population and Sampling Technique

The respondents of the study were the Grade 5 pupils in West District Schools in Cagayan de Oro City School Year 2024-2025. The schools were identified as big schools and medium schools in the district. The table below shows the number of pupil respondents of the study. The researcher used Slovin's Formula with a 0.05 margin of error to obtain two hundred (200) respondents from the population of one thousand six hundred sixty-two (1, 662) students. After determining the sample size, stratified random sampling was utilized to obtain the percentage and appropriate number of respondents in every school. This was done by dividing the sample size by its population. Stratified random sampling is a widely used statistical technique in which the population is divided into subgroups or strata based on some shared characteristics.

Table 1: Distribution of Respondents per School

Schools	Population	Sample size
Big Schools		
West City Central School	608	73
Bulua Central School	550	73
Medium Schools		
Macanhan Elementary School	245	27
Iponan Elementary School	259	27
Total	**1662**	**200**

Research Instruments

The research instrument employed in this study was a patterned and modified questionnaire. It has two parts: Part I dealt with students' engagement, which is composed of affective-emotional in terms of attitude, interest, and sense of belonging; cognitive in the aspect of persistence, willingness, and motivation; as well as behavioral on participation in activities. These variables were taken from the study of Fredricks (2004). Part II dealt with the students' performance skills in Science on Remembering, with the following topics: Useful Materials, Harmful Materials, and 5R's Techniques; Understanding, with the following topics: Matter, Physical Properties of Matter, and Chemical Properties of Matter; Applying, with the following topics: Environmental Effects of Gasoline, Changes in Matter in the Presence or Absence of Oxygen, and Causes of Fish Kills; Analyzing, with the following topics: Changes of Matter through Application of Heat, Pasteurization: Applying Heat to Destroy Pathogens in Food, and Changes in Matter and Waste Reduction; Evaluating, with the following topics: Recycling Solid Materials, Materials Recovery Facilities, and Recycling Liquid Materials; and Creating, with the following topics: Composting Organic Materials, Creating Plant Pots with Plastic Pottles; Creating, with the following topics: with

Plastic Spoons and Forks, and Creating Home Decors with Plastic Straws. The variables were taken from the revised Bloom's Taxonomy by Anderson and Krathwohl (2001), and the topics were based on the First Quarter Science 5 Most Essential Learning Competencies (MELCs).

Statistical Treatment of Data

To describe the learners' engagement in affective-emotional, cognitive and behavioral engagement, mean and standard deviation were employed. As to the performance skills of the respondents, frequency, percentage, mean and standard deviation were utilized. Furthermore, for the significant relationship between students' engagement and students' performance skills, Pearson Product Moment Correlation was used.

Ethical Consideration

The researcher has observed the necessary ethical considerations prior to the gathering of data. Before embarking on the research, the researcher sought the approval of an ethics review board, which is responsible for evaluating the ethical implications of the proposed study. The necessary permission and approval were obtained from the Dean of Graduate and Professional Studies PHINMA Cagayan de Oro College and the Schools Division Superintendent. The approved letter from the Schools Division Superintendent was then forwarded to the school heads of the school of the student-respondents. The researcher explained to the students the rationale and purpose of the study and, that their participation was voluntary and they could withdraw anytime if they were no longer willing to participate. Students were informed and assured that all the data will be treated with utmost confidentiality. Their names and identities would not be identified to maintain their anonymity while collecting, recording, and analyzing the data. The data collected were encrypted to ensure that nobody could read and divulge the information and results. A password protected account or folder was utilized.

RESULTS AND DISCUSSION

Problem 1. What are the Respondents' Level of Engagement in Terms of Affective-Emotional: Attitude, Interest, Sense of Belonging; Cognitive Engagement: Persistence, Willingness, Motivation; and Behavioral Engagement: Participation in Activities?

Table 2: Summary on the Learners' Level of Engagement

Variables	Mean	SD	Interpretation
Affective-Emotional	3.25	0.82	High
Cognitive Engagement	3.20	0.81	High
Behavioral Engagement	3.23	0.79	High
Overall	**3.23**	**0.81**	**High**

Legend:
3.26-4.00 At all Times / Very High
2.51-3.25 Most of the Time / High
1.76-2.50 Sometime / Low
1.00-1.75 Never / Very Low

Table 2 presents the summary of the level of engagement with an overall mean of 3.23 (SD = 0.81), interpreted as High. It means that the level of engagement could be attributed to various factors such as the relevance of the content, the delivery methods, and the pupils' personal interests. When pupils found a subject meaningful or aligned with their future goals, they were more likely to remain attentive and engaged.

Additionally, effective teaching strategies, such as interactive discussions and real-world applications, may have played a role in keeping them involved. The high engagement indicated that the learning environment and materials likely supported active learning. However, it also suggests room for improvement, especially in enhancing engagement for pupils who may not always have felt connected. This could inform future strategies to address individual differences in learning styles, ensuring that engagement remained high across diverse learner profiles. Overall, maintaining or boosting this level of involvement would likely continue to lead to improved learning outcomes, making it essential to regularly assess and refine instructional approaches. Research by Fitzgerald and Palincsar (2019) supports this by highlighting the importance of effective teaching practices, such as collaborative learning and project-based approaches, which can significantly enhance pupils engagement across various disciplines.

In line with this, the variable Affective-Emotional, got the highest mean of 3.25 (SD = 0.82), interpreted as High. This strong emotional connection may have been linked to a positive classroom atmosphere, where pupils felt supported and valued. Teachers who fostered a sense of belonging and encouraged participation likely contributed to this high emotional engagement. Creating a supportive and inclusive classroom atmosphere, using relatable and hands-on activities, and encouraging collaborative learning. When pupils experienced positive emotions during learning, such as successfully conducting an experiment or solving a problem, it can boost pupils' confidence and foster a deeper connection to the subject and they were more likely to put effort into their studies and persevere through challenges.

Moreover, this finding indicates that emotional support was crucial for sustained pupils engagement. It also

highlights the importance of creating an environment where pupils felt safe to express themselves and were motivated to learn. Fostering such emotional bonds could have improved not just short-term engagement but also long-term academic success and personal development. This is consistent with findings from Attard *et al.* (2020), positive emotions are shown to significantly enhance both interest and deeper engagement with the subject matter.

On the other hand, the variable Cognitive Engagement got the lowest mean of 3.20 (SD = 0.81), interpreted as High. This means that the slightly lower score in this area might have suggested that while pupils were engaged overall, they may not always be fully challenged or deeply immersed in the cognitive aspects of their tasks. It implies a need for more opportunities to engage in higher-order thinking, such as analysis, synthesis, and evaluation. This pointed to the importance of incorporating activities that challenged pupils intellectually and encouraged them to think more critically about the material.

Moreover, the gap between emotional and cognitive engagement could also have highlighted that while pupils felt emotionally connected, they may not always have found the content intellectually stimulating. A significant gap can occur when pupils feel excited about Science activities but lack the strategies or support to fully engage with the content cognitively. Bridging this gap requires teachers to design lessons that not only stimulate curiosity and positive emotions but also challenge pupils intellectually. Adjusting teaching methods to include more thought-provoking tasks could have enhanced cognitive involvement, leading to a more balanced and comprehensive learning experience. Gundaya (2023) found that critical thinking allows pupils to process information logically and prepare themselves for self-directed learning. Pupils with critical thinking skills can determine what information is important and what is irrelevant or not useful. As noted by Kamarrudin (2023), fostering cognitive engagement through strategies that promote higher-order thinking skills is crucial in education, as it drives deeper understanding and mastery of the material.

Problem 2. How Do the Respondents Assess Their Science Performance Skills in the First Quarter Based on Remembering, Understanding, Applying, Analyzing, Evaluating, and Creating?

Table 3: Summary Level of Assessment of Respondents' Performance Skills

Variables	Mean	SD	Interpretation
Remembering	3.92	0.97	High
Understanding	4.09	0.93	High
Applying	4.12	0.94	High
Analyzing	3.97	0.96	High
Evaluating	4.25	0.90	High
Creating	4.13	1.00	High
Overall	**4.08**	**0.95**	**High**

Legend:
4.50-5.00 Outstanding/Very High
3.50-4.49 Very Satisfactory/High
2.50-3.49 Satisfactory/Moderate
1.50-2.49 Understanding/Low
1.00-1.49 Poor/Very Low

Table 3 shows the summary level of assessment of respondents' performance skills in the First Quarter with an overall mean of 4.08 (SD = 0.95), interpreted as High. It means that while the respondents were competent, there remained room for improvement to achieve excellence. It was possible that factors such as the availability of resources, the effectiveness of instructional strategies, or the complexity of tasks may have influenced this overall rating. A "Good" rating signifies that the respondents were meeting expectations, but they may not have been consistently exceeding them. Improving their skills could have potentially involved more targeted training or additional support to help them perform at an "Excellent" level.

Moreover, achieving consistency in higher performance across various indicators may have resulted in better overall outcomes and more reliable performance over time. This aligns with Fitzgerald and Palincsar's (2019) findings, which emphasize the role of collaborative learning and project-based approaches in enhancing performance skills by engaging pupils more effectively. Increased engagement, as explored by McKellar *et al.* (2020), has been positively correlated with improved performance in various subjects, suggesting that fostering deeper involvement in learning activities could further elevate the respondents' performance.

Further, the variable Evaluating obtained the highest mean of 4.25 (SD = 0.90), interpreted as High. This means that respondents excelled in their ability to assess and make judgments about their tasks, possibly reflecting strong critical thinking and decision-making skills. The high rating in this area may have been due to well-structured opportunities for evaluative thinking within their environment, as well as effective guidance from mentors or supervisors. It also suggested that respondents were confident in their ability to analyze information and arrive at reasoned conclusions. Strength in this area was critical, as the ability to evaluate situations effectively could lead to more accurate and successful

outcomes. It implied that the respondents may have been better equipped to handle complex, problem-solving tasks where judgment was key, potentially enhancing their overall productivity and contribution to the team or organization. Lewis (2019) supports this by highlighting the significance of the evaluation phase in teaching, where pupils are encouraged to critically assess the information they encounter. Likewise, the Center for Excellence in Learning and Teaching (2024) emphasizes that engaging pupils in evaluative tasks fosters deeper cognitive engagement, aligning with Fredricks *et al.*'s (2019) findings that engagement is directly linked to higher academic achievement and critical thinking skills.

Furthermore, the variable Remembering, got the lowest mean of 3.92 (SD = 0.97), interpreted as High. This means that while respondents were capable of recalling information, they may not have done so as effectively as they performed higher-order thinking tasks. Also, remembering is considered the lowest indicator of mastery because it reflects only surface-level understanding and does not inherently demonstrate higher cognitive abilities such as application or critical thinking. Several factors may have accounted for this, such as the way information was presented or retained, or possibly the frequency with which they were required to recall basic knowledge in their roles. Memorization without deeper engagement can lead to short-term retention, where information is easily forgotten after assessments, making it ineffective for long-term learning and skill development. The rating indicated that while remembering was not a major weakness, it could have been an area of improvement.

Enhancing this skill could have contributed to better overall performance, as remembering basic information accurately formed the foundation for more complex cognitive tasks. By strengthening memory skills, respondents could have improved their ability to perform a wider range of tasks more efficiently and with greater consistency. Krathwohl (2018) points out that memory retention strategies, such as mnemonic devices and repetitive practice, can significantly boost remembering skills. This is reinforced by Lei (2018), who found that active participation in tasks that require memory recall, such as hands-on activities, enhances student engagement and supports long-term retention of knowledge.

Problem 3. Is There a Significant Relationship between the Learner's Engagement and Their Performance Skills in Science?

Table 4: Correlation Between the Level of Engagement of the Learners and Their Assessment Performance Skills in Science

Correlation		**Performance Skills**						
Engagement		**Remembering**	**Understanding**	**Applying**	**Analyzing**	**Evaluating**	**Creating**	**Over-all**
Affective-Emotional	Pearson r	0.070	-0.001	0.136	0.131	0.147	0.148	0.182
	p-value	0.327	0.994	0.054	0.064	0.038	0.036	0.010
		S	S	S	S	S	S	S
Cognitive Engagement	Pearson r	0.078	-0.013	0.149	0.207	0.194	0.248	0.249
	p-value	0.272	0.850	0.035	0.003	0.006	<0.001	<0.001
		S	S	S	S	S	S	S
Behavioral Engagement	Pearson r	0.124	0.031	-0.019	0.208	0.125	0.120	0.170
	p-value	0.080	0.661	0.785	0.003	0.077	0.090	0.016
		S	S	S	S	S	S	S

Legend : Relationship Strength Scale:1(Perfect); $p < 0.05$ (significant)

Table 4 presents the correlation between the student engagement of the learners and assessment performance skills in Science, revealing varying degrees of significance and relationship strength across different types of engagement. The highest correlation was between cognitive engagement and overall performance skills in Science subject, which showed a weak relationship strength but was significant ($r = 0.249$, $p < 0.001$). The results indicate a significant correlation between pupils engagement and Science performance, thus the null hypothesis is rejected. It also suggests that pupils who think deeply and critically about the subject tend to perform better in their assessments. This finding highlights the importance of encouraging pupils to engage in higher-order thinking, such as analyzing and evaluating scientific concepts. When learners actively participate in their learning process, they are more likely to understand complex ideas and apply them effectively. Teachers can foster cognitive engagement by incorporating discussions, problem-solving tasks, and hands-on experiments into the curriculum. By creating an environment where pupils feel comfortable exploring ideas and asking questions,

educators can enhance their academic performance in Science. Since cognitive engagement improves pupils' capacity for critical thought, knowledge application, and the development of fundamental scientific skills, it serves as a motivator for high science performance. Pupils' ability to succeed in Science learning may be limited if cognitive engagement is lacking, as performance abilities may continue to be underdeveloped. Hence, encouraging participation and hands-on learning opportunities is essential for Science education success.

Moreover, this connection between cognitive engagement and performance may encourage educators to prioritize strategies that stimulate critical thinking in their lesson plans. As pupils become more engaged mentally, they may develop a greater interest in Science, leading to improved long-term outcomes. Fitzgerald and Palincsar (2019) supported this by demonstrating that project-based learning strategies significantly improve cognitive engagement, which is crucial for performance in Science. Similarly, Kamarrudin (2023) affirmed that higher-order cognitive engagement directly influences pupils' academic success, particularly in Science subjects.

Conversely, the lowest overall correlation was between behavioral engagement and overall performance skills, which shows significantly very weak relationship with ($r = 0.170$, $p = 0.016$). This suggests that simply participating in class activities or being present may not significantly impact how well pupils perform in the subject. It could mean that being engaged on a surface level does not lead to a deeper understanding or application of scientific concepts. Pupils might attend classes and complete assignments without truly grasping the material.

Moreover, this situation points to the need for teachers to create more engaging and meaningful learning experiences that go beyond mere attendance. Educators should consider implementing interactive activities that motivate pupils to engage more deeply with the content. This approach can help transform behavioral engagement into something more impactful, allowing pupils to connect their actions with their learning outcomes in Science.

Lei (2018) highlighted that while behavioral engagement plays a role in pupils involvement, it is the depth of this engagement—such as hands-on participation in Science activities—that has a meaningful impact on performance. Fredricks *et al.* (2004) claimed that academic engaged time, that is, the amount of time pupils are actively involved, predicts academic achievement and engagement is directly related to learning outcomes. Also, Ozer (2018) emphasized that active participation in school-related activities improves behavioral engagement, contributing positively to overall academic achievement, even though the direct correlation may sometimes be weak.

CONCLUSION

The study investigated the relationship between learners' engagement and performance skills. Results suggest that fostering emotional connections, cognitive engagement and behavioral engagement significantly impacts pupils' success. Educators can enhance both academic achievement and real-world skills by creating supportive learning environments, promoting higher-order thinking, and encouraging self-evaluation. The findings indicate a strong correlation between learners' engagement and their Science performance, leading to the rejection of the null hypothesis.

Recommendations

Based on the given conclusions of the study, several recommendations are presented:

1. Teachers should incorporate more challenging and thought-provoking tasks in their lessons to enhance cognitive engagement. This can include open-ended questions, group discussions, and project-based learning that encourage pupils to think critically and deeply about the subject matter. By doing so, educators can create a more stimulating learning environment that fosters both emotional and cognitive investment in their studies.
2. Teachers should adopt effective study techniques that enhance their ability to recall information. This can involve using mnemonic devices, summarizing key points after lessons, and practicing retrieval through quizzes and flashcards. By actively working on their memory skills, students can boost their performance across various assessments and retain information more effectively.
3. Teachers should focus on enhancing the quality of interactions during lessons to improve behavioral engagement and overall performance skills. Instead of just having pupils participate in activities, it is important to ensure that these activities are relevant and connected to real-world applications of Science concepts. This can be achieved by incorporating hands-on experiments, group projects, and discussions that stimulate curiosity and critical thinking. Additionally, teachers should provide timely feedback and create a supportive classroom environment where pupils feel valued and encouraged to share their ideas. By making learning more meaningful, teachers can foster a deeper understanding of Science, ultimately improving pupils' performance skills.

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