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PROFICIENCY IN SCIENCE PROCESS SKILLS AND LEARNERS' COGNITIVE PERFORMANCE IN MANOLO FORTICH, BUKIDNON

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ABSTRACT

Science process skills are crucial for students to grasp scientific concepts thoroughly, alongside with the learners' cognitive performance. However, observations suggest that not all young learners in public elementary schools can think critically, limiting the majority's ability to apply these skills to real-world problems. This study aimed to determine the level of proficiency in Science process skills and learners' cognitive performance in Manolo Fortich, Bukidnon. Specifically, it sought to 1) find the respondents' proficiency level in Science process skills, 2) find the respondents' level of cognitive performance, and 3) determine the significant relationship between the respondents' proficiency in Science process skills and their cognitive performance. There were one hundred fifty (150) Grade V learners in the schools where this study was conducted. A questionnaire was patterned and modified from the self-learning modules and a summative test in Science 5 of the Department of Education was used in the study. A

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descriptive correlational method of research was employed in the study. The data collected were analyzed using mean score, mean percentage, standard deviation, and Spearman's Rho Correlation.

The study revealed that learners' proficiency in Science process skills did not meet expectations except for measuring and classifying skills, which are satisfactory. Additionally, the learners' level of cognitive performance in Science in all areas did not meet the expectations. There was a significant relationship between learners' proficiency in Science process skills except in observing, controlling variables, and hypothesizing. There is a disparity in the proficiency in Science process skills, a gap in cognitive performance, and a meaningful relationship between Science process skills and cognitive performance among Grade V learners. It is recommended that teachers should improve their art of questioning for cognitive evaluation to guide learners in answering difficult questions. Link hypothesizing to real-world applications, fostering data evaluation through interactive learning, and embracing sensemaking to enhance skills and performance to cultivate a dynamic Science learning environment where Grade V learners thrive with curiosity and understanding.

Keywords: *Science Process Skills, Cognitive Performance*

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I. INTRODUCTION

Science Process Skills are essential for students to develop a deep understanding of scientific concepts and principles. These skills enable them to conduct scientific investigations, analyze data, and make informed decisions based on evidence. However, observed scenarios in the Science classes have been noted wherein only some of the young learners in public elementary schools are able to think critically, hindering the majority of the learners from applying these process skills to solve real-world problems. When group work is done, only the leaders of the groups understand the application of Science concepts to the activities. Hence, this holds true in Manolo Fortich, Bukidnon, as the district-level consolidated First Quarter Curriculum Management Support System (CMSS) proficiency level in Science, of which results reflect the chains of assessment results (authentic and traditional assessments) involving remembering, understanding, analyzing, evaluating, creating and applying Science process skills, revealed that out of six hundred fifteen (615) Grade V learners, only 18.54% have mastered these skills.

In the Philippines, the Department of Education recognizes the importance of developing Science process skills among students. It has integrated them into the Science curriculum to help students be prepared for the demands of the 21st century and enable them to become scientifically literate individuals who can contribute to the advancement

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of society. One way to attain this is the issuance of DepEd Order No. 21, s. 2019, or the Policy Guidelines on the Implementation of the K to 12 Science Curriculum, provides the framework for the teaching of Science in the K to 12 Program to emphasize the importance of developing Science process skills, such as observing, classifying, inferring, predicting, measuring, communicating, and experimenting. Another is DepEd Memorandum No. 175, s. 2017, or the Conduct of the 2017 National Science and Technology Fair, to promote the development of Science process skills among elementary pupils. The memorandum encourages schools to participate in the annual Science and Technology Fair, which provides a platform for pupils to showcase their knowledge and skills in Science.

Unfortunately, the 2019 National Achievement Test results showed that only 44.52% of Grade 6 students in the Philippines passed the Science test. This indicates that a significant number of elementary pupils lack proficiency in Science process skills. The study also revealed that pupils with higher proficiency in Science process skills had higher achievement in Science. One of the reasons for the low proficiency of elementary pupils in Science process skills is the lack of emphasis on these skills in the classroom. A study by Widodo and Budijastuti (2020) found that teachers tend to focus on teaching theoretical concepts rather than Science process skills. This results in pupils having limited opportunities to develop their skills in observing, classifying, measuring, inferring, predicting, and communicating.

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Moreover, the Programme for International Student Assessment (PISA, 2019) results indicated that the Philippines ranked 78th out of 79 countries in Science proficiency (Bernardo et al., 2023). This is a significant drop from its previous ranking of 69th in 2015. The results showed that only 1.8% of Filipino students reached the highest level of proficiency in Science, while 29.5% scored below the minimum level of proficiency. This indicates a serious problem in the quality of Science education in the country.

Problems regarding the proficiency level of learners in Science process skills do not just arise in the Philippines but in the international arena as well. Studies have shown that many students lack proficiency in these skills, which can hinder their ability to learn Science effectively (Kuiper, 2018). This problem is particularly acute in developing countries, where resources for Science education are limited, and teachers may not have the necessary training or support to teach Science process skills (Abdullahi, 2019) effectively.

If these problems are left unresolved, it would imply that students may have difficulties interpreting and analyzing scientific data. For instance, students may struggle to identify patterns or draw conclusions from data, which can hinder their ability to understand scientific concepts. Additionally, it can hinder students' ability to conduct scientific investigations. For example, students may struggle to design experiments or make accurate measurements, which can lead to unreliable results. This can also impact their

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ability to make accurate predictions or hypotheses, which are essential components of scientific inquiry and career success in the long run.

Significantly, it is crucial for the Philippines to improve the proficiency of students in Science process skills. This is because these skills are essential not only in science but also in everyday life. Students who are proficient in Science process skills are better equipped to make informed decisions and solve problems. The proficiency of students in Science process skills in the Philippines needs improvement.

Thus, it is in this context that this study was conducted to find the level of the learners' proficiency in Science process skills and their cognitive performance in Manolo Fortich, Bukidnon, SY 2023-2024.

II. MATERIALS AND METHODS

Research Design

This study made use of the descriptive survey method of research. The descriptive research method is used to describe the characteristics of a population or phenomenon being studied. It involves the systematic collection of data to describe and summarize information about a particular area of interest. This method is often used in social Sciences, such as Psychology, Sociology, and Education.

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One recent reference that discusses the use of descriptive research in education is a paper by Singh and Sharma (2021) titled "Descriptive Research in Education: An overview." The authors highlight the importance of using descriptive research methods in education to understand the characteristics of students, teachers, and the learning environment.

Thus, it is the most appropriate design to gather information about the proficiency in Science process skills of Grade V pupils for the School Year 2023-2024. After participants answer the questions, the researcher describes the responses given.

Research Setting

The study was conducted in District 3 of Manolo Fortich, Division of Bukidnon, during the School Year 2023-2024.

Manolo Fortich is a first-class municipality located in the province of Bukidnon, Philippines. It is situated in the Northern part of the province, bounded by the municipalities of Libona to the north, Malitbog to the east, Sumilao to the south, and Impasugong to the west. The municipality has a total land area of approximately 163.1 square kilometers and is home to a population of around 51,000 people as of the 2020 census. The majority of the population are indigenous Bukidnon people who engage in farming, livestock raising, and other agricultural activities.

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The municipality of Manolo Fortich is composed of four equally competitive school districts, namely the Manolo Fortich I, II, III, and IV, respectively. The Department of Education-District III of Manolo Fortich has seven (7) elementary schools, one (1) national high school, three (3) private schools, one (1) integrated school and one (1) Indigenous people school. The researcher selected Plantation Central Elementary School, Sankanan Elementary School, Kalugmanan Elementary School, Camp 1 Elementary School, Lindaban Elementary School and Dahilayan Integrated School.

The Researcher selected only the schools near her assigned school for the accessibility of distributing and the retrieval of questionnaires. The results of the study would be beneficial for the schools involved within the district.

Respondents and Sampling Procedures

The respondents of the study were the one hundred fifty (150) Grade V learners in the select Elementary Schools of District 3, Manolo Fortich, Bukidnon, for the School Year 2023-2024. The respondents were determined using Slovin's Formula with a population of five hundred forty-five (545) and a margin of error, which is seven percent (7%). Moreover, stratified sampling was employed to get the percentage and appropriate number of respondents in each school. This was done by dividing the computed sample size by its population. The distribution of respondents by school is shown in Table A.

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Below is the table of the distribution of respondents by school.

Table A

Distribution of Respondents

Schools	Population	Respondents
Dahilayan Integrated School (Elementary)	55	15
Camp 1 Elementary School	61	16
Kalugmanan Elementary School	67	18
Lindaban Elementary School	75	20
Sankanan Elementary School	87	25
Plantation Central Elementary School	200	56
Total	545	150

Research Instrument

The instrument used in gathering the necessary information is a questionnaire of two parts. Part 1 elicited the learner's level of proficiency in Science process skills: observing, measuring, classifying, predicting, communicating, controlling variables, hypothesizing, experimenting and interpreting data. The questionnaire is patterned and modified from the self-learning modules in Science 5 of the Department of Education that include the First and Second quarter topics. Moreover, six (6) items in measuring, six (6) items in

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classifying, six (6) items in controlling variables and six (6) items in hypothesizing were added and modified by the researcher to make questions align with the identified Science process skills that cater the current level of respondents. It has a total of fifty-four (54) items, with six (6) items in each variable.

Part 2 determined the level of the learners' cognitive performance. This is taken from the summative tests in Science 5 of the First and Second Quarters. This consists of the six (6) cognitive dimensions in the framework of Bloom's Taxonomy, namely Remembering, Understanding, Applying, Analyzing, Evaluating, and Creating. It has a total of sixty (60) items, with ten (10) items each variable.

There are sections in this part of the test questionnaire wherein rubrics were provided to help the researcher evaluate the level of cognitive performance of the learners. It was given to determine the scores of the learners. By using this rubric, the researcher was able to provide clear expectations and learners were guided on how their responses were given its corresponding points. In Applying, learners were instructed to list ways to take care of their reproductive organs. The rubric included criteria such as the number of different ways listed. Higher points were awarded for providing a greater number of diverse ways to care for reproductive organs. The rubric allowed the learners to have consistent evaluation and understand the expectations for their responses.

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Additionally, in evaluating as another variable under cognitive performance, learners were asked to answer questions to assess their learning about topics on reproduction and menstruation. A rubric was provided to assess their answers. It included criteria such as responding correctly and providing reasons to support their answers. Higher points were awarded for providing a correct answer in a sentence with two supporting details. The rubric helped the teacher evaluate the depth of understanding demonstrated by the learners.

In terms of creating, meanwhile, learners were given two different activities. In the first activity, they were asked to create a food chain in an estuary and label the organisms correctly. The rubric provided respective scores to their food chain diagrams or illustrations. It included criteria such as the correct arrangement of organisms, the complete direction of energy flow, and the completeness of labeling. It ensured that learners would include the necessary components in their food chain representation and provide a clear assessment framework. In the second activity, they were asked to provide ways to protect estuaries and intertidal zones. The rubric included criteria such as the number of different ways provided to protect estuaries and intertidal zones. Higher points were awarded for providing different ways.

The researcher made a Table of Specifications to make sure that all topics in the First and Second Quarters in Science 5 are covered in the test instrument crafted. The TOS

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sought approval from the Master Teachers and school administrators involved in the research setting of this study.

Validation of Instrument

The instrument was pre-tested to thirty (30) Grade V learners at Mampayag Elementary School last September 25, 2023, who have the same characteristics as those of the final respondents, but they did not participate in the actual study. This was done to ensure that the data collected was valid and reliable. The result of the validation was quite good. There were no queries about the instrument except on the mechanics and organization of some items. After the tryout, all suggestions and recommendations of the respondents were used to enrich the tests administered in the study.

Data Gathering Procedures

The researcher secured official permission from the dean of the Graduate School of Cagayan de Oro College (COC). A recommendation letter was brought to the Schools Division Superintendent (SDS) of Bukidnon for approval. After the permit was signed by the Schools Division Superintendent, the permit was presented to the Public Schools District Supervisor and then to the Schools Heads of the selected schools.

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Moreover, to secure the consent of the respondents, the researcher relayed all important details, including its purpose and significance. Through this, the respondents were able to understand the importance of their role in the completion of the study.

The tests were distributed and administered by the researcher. Each test item was read, explained, and interpreted in the local dialect to the respondents. Three (3) hours were given to the respondents to read, understand and answer the questionnaire. The researcher personally collected the tests after the respondents were done answering. Papers were thoroughly checked to see if all the items were attended to, and data was tabulated, tallied, analyzed, and interpreted.

System of Scoring

The following categories and system of scoring are presented below.

Part I. Proficiency in Science Process Skills and Cognitive Performance (Source: DepEd Order No. 08 s.2015)

Scale	Numerical Rating	Description
5	90-100%	Outstanding
4	85-89%	Very Satisfactory
3	80-84%	Satisfactory

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2	75-79%	Fairly Satisfactory
1	Below 75%	Did Not Meet Expectations

Statistical Treatment

The analysis and interpretation of the data were aided by the following statistical tools.

Descriptive statistics such as frequency, mean percentage, mean and standard deviation were utilized to describe the respondents' proficiency in Science process skills, as well as the level of the learners' cognitive performance.

Spearman Rho Correlation was used instead of Pearson Product Moment Correlation Coefficient (r) because the data distribution was not normal. It was utilized to determine the significant relationship between the learner's proficiency in Science process skills and their level of cognitive performance.

III. RESULTS AND DISCUSSION

Result of the Test on Relationship between the Respondents' Proficiency in Science Process Skill and their Cognitive Performance

Science Process Skills	Cognitive Performance						Overall	Interpretation
	Remembering	Understanding	Applying	Analyzing	Evaluating	Creating		
Observing	-0.0001	0.005	0.072	0.167	0.064	0.085	**0.138**	Not Significant

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	0.999	0.955	0.381	0.041	0.435	0.302	**0.091**	
Measuring	0.064 0.433	0.135 0.099	0.281 0.001	0.238 0.003	0.175 0.032	0.172 0.036	**0.314** **0.001**	Significant
Classifying	0.095 0.249	0.151 0.066	0.293 0.001	0.172 0.035	0.205 0.012	0.207 0.011	**0.308** **0.001**	Significant
Predicting	0.130 0112	0.027 0.742	0.187 0.002	0.157 0.054	0.104 0.205	0.067 0.417	**0.176** **0.031**	Significant
Communicating	0.095 0.248	0.209 0.010	0.343 0.001	0.217 0.008	0.276 0.001	0.332 0.001	**0.398** **0.001**	Significant
Controlling Variables	0.127 0.121	-0.119 0.146	0.070 0.392	0.190 0.020	0.088 0.283	0.095 0.249	**0.124** **0.129**	Not Significant
Hypothesizing	0.062 0.451	-0.184 0.024	0.106 0.197	0.275 0.001	0.110 0.178	0.108 0.190	**0.141** **0.086**	Not Significant
Experimenting	0.035 0.670	0.085 0.303	0.177 0.030	0.137 0.094	0.140 0.087	0.125 0.126	**0.193** **0.018**	Significant
Interpreting Data	0.128 0119	0.142 0.083	0.347 0.001	0.318 0.001	0.311 0.001	0.225 0.006	**0.388** **0.001**	Significant
Overall	**0.198** **0.015**	**-0.022** **0.788**	**0.300** **0.001**	**0.322** **0.001**	**0.283** **0.001**	**0.209** **0.010**	**0.347** **0.001**	**Significant**

Significant at p<0.05 alpha level

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The table presents the result of the test on relationship between the learners' proficiency in Science process skills and their cognitive performance. The overall rho-value is 0.347 (p=0.001) described as **Significant**. Thus, this study rejects the null hypothesis that there is no significant relationship between the respondents' proficiency in Science process skills and their cognitive performance. This result denotes that there is a meaningful connection between learners' proficiency in Science process skills and their cognitive performance. The significant relationship suggests that as learners' proficiency in Science process skills improves, their cognitive performance tends to also improve, to a moderate extent. Further, the significance of the relationship indicates that this association is unlikely to have occurred by chance alone. The p-value of 0.001 suggests a high level of statistical significance, further supporting the credibility of the relationship observed, hence the result is generalizable.

As noticed, proficiency in Science process skills, such as observing, experimenting, and measuring can contribute to better cognitive performance, while enhanced cognitive abilities can facilitate the development and application of Science process skills. Improvements in Science process skills can have a positive impact on learners' overall cognitive performance. This synergy between the two domains suggests that focusing on developing Science process skills can lead to broader cognitive growth and enhancement.

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When learners develop strong Science process skills, they become adept at observing and gathering data accurately. They learn to ask meaningful questions, formulate hypotheses, and design experiments to test their ideas. This process encourages them to think analytically and systematically, fostering the development of logical reasoning and problem-solving skills (Hasanah & Shimizu, 2020).

Between learners' proficiency in Science process skills and their cognitive performance, **Analyzing** has the highest positive relationship with the Science process skills among learners with the rho-value of 0.322 (p=0.001) described as **Significant.** This means that there is a meaningful and reliable association between learners' proficiency in analyzing as a cognitive performance, and their overall Science process skills. The positive relationship suggests that as learners' proficiency in cognitive performance, specifically in terms of analyzing, improves, their Science process skills also tend to improve, although to a moderate extent.

As observed, when learners excel in analyzing scientific information, they are more likely to possess a remarkable ability to deconstruct complex information, discern patterns, and extract meaningful insights. This analytical capability empowers them to delve deeply into subjects, critically evaluate evidence, and make informed judgments.

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At the heart of their analytical aptitude lies a strong foundation of cognitive skills. Learners with a high level of analyzing demonstrate exceptional attention to detail, enabling them to meticulously examine information and identify subtle nuances that others might overlook. Their capacity for logical reasoning allows them to identify cause-and-effect relationships, recognize logical fallacies, and construct coherent arguments (Dolapcioglu & Subası, 2022).

On the other hand, between learners' proficiency in Science process skills and their cognitive performance, **Understanding** has the only negative relationship with the Science process skills among learners with the rho-value of **-**0.022 (p=0.788) described as **Not Significant.** This means that there is no meaningful association between learners' proficiency in understanding and their overall Science process skills. The negative relationship implies that improvements in learners' cognitive performance in terms of understanding do not necessarily lead to improvements in their Science process skills. The rho-value close to zero suggests a negligible or minimal association between these two variables. The lack of statistical significance further denotes that the relationship between understanding and Science process skills is not statistically significant. This suggests that any observed relationship between understanding and Science process skills is likely due to chance and does not reflect a meaningful and reliable association. Hence, this specific result is only applicable in the context of this study.

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However, as perceived, Understanding, as a cognitive performance, significantly contributes to the development or proficiency of Science process skills among learners. Learners' ability to comprehend scientific concepts and principles has an impact to their proficiency in Science process skills. When learners have a deep understanding of the subject, it is likely that they are able to connect the dots and make sense of complex scientific concepts. This skill goes beyond just memorizing facts, but it shows that they can analyze, evaluate, and synthesize information in a meaningful way.

By comprehending scientific concepts, learners gain a deeper understanding of the underlying principles that govern the natural world. This understanding provides a framework for them to develop hypotheses, design experiments, and analyze data effectively. It allows them to observe phenomena accurately, make informed inferences, generate reliable predictions, and communicate their findings in a coherent manner (Vosniadou, 2019).

On the other hand, in the context of this study, educators and curriculum designers may need to emphasize other cognitive performances or areas of focus in order to enhance learners' Science process skills. Understanding, while important in its own right, may not have a direct influence on the development of Science process skills.

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Meanwhile, between learners' proficiency in Science process skills and their cognitive performance, **Communicating** has the highest positive relationship with the cognitive performance among learners with the rho-value of 0.398 (p=0.001) described as **Significant.** This means that there is a meaningful and reliable association between learners' proficiency in communicating and their cognitive performance. The positive relationship suggests that as learners' ability to effectively communicate scientific ideas and findings improves, their overall cognitive performance tends to improve as well, to a moderate extent.

As observed, effective communication is a crucial skill in Science education as it enables learners to convey their understanding of scientific concepts, share their insights, and engage in meaningful scientific discourse. When learners excel in communicating, they can articulate their thoughts clearly, use appropriate scientific language, and present their ideas in a structured and coherent manner.

To make sure learners continue to improve in their cognitive performance, teachers can create an environment that encourages effective communication. They can design activities that allow students to present their ideas, engage in conversations, and collaborate with their classmates (Winn et al., 2019). It is like setting the stage for learners to showcase their communication skills and take center stage in their learning journey.

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On the other hand, between learners' proficiency in Science process skills and their cognitive performance, **Controlling Variables** is the process skill which has the least positive relationship with the cognitive performance among learners with the rho-value of 0.124 (p=0.129) described as **Not Significant**. This means that there is no meaningful or significant relationship between Controlling Variables and cognitive performance among learners. The rho-value close to zero suggests a negligible or minimal association between these two variables. This further suggests that the learners' proficiency in Controlling Variables, a Science process skill, does not have a direct impact on their cognitive performance. The ability to control variables in scientific experiments may not be a significant predictor of overall cognitive abilities.Additionally, the non-significance of the relationship indicates that any observed correlation between controlling variables and cognitive performance is likely due to chance and not generalizable. Meaning, the result is not a consistent pattern and may not be true to all settings.

As perceived, the quality and effectiveness of instruction can significantly impact learners' ability to acquire and apply scientific knowledge, develop critical thinking skills, and engage in scientific practices. When instruction in Science is of high quality, learners are provided with well-designed learning experiences that promote active engagement, conceptual understanding, and the application of scientific concepts to real-world contexts. Such instruction encourages learners to think critically, analyze data, make

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connections, and solve problems. As a result, their cognitive performance in Science is likely to be enhanced.

Moreover, there may be other contextual factors, such as the complexity of experimental designs, the level of instruction, or the specific cognitive demands of the tasks, may influence the relationship between Controlling Variables and cognitive performance (Xu et al., 2021). Further investigation is needed to better understand these factors and their implications.

Meanwhile, among the learners' proficiency in Science process skills and their cognitive performance, **Interpreting Data** and **Applying** has the greatest rho-value of 0.347 (p=0.001) described as **Significant**. This means that there is a meaningful and significant association between Interpreting Data as a Science process skill and Applying as a cognitive performance. This would imply that as learners' proficiency in Interpreting Data improves, the cognitive performance of learners in Applying also improves, however, to a moderate extent only. Further, the significant positive relationship puts emphasis on the significance of Interpreting Data and Applying in the context of Science process skills and cognitive performance.

As noticed, proficiency in these skills plays a crucial role in learners' ability to analyze and understand scientific data and apply it to real-world situations. Interpreting

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Data and Applying skills require learners to utilize various cognitive abilities, such as critical thinking, analysis, problem-solving, and logical reasoning. The positive relationship observed implies that as learners develop and strengthen these skills, their cognitive abilities across multiple domains may also be enhanced.

Further, Interpreting Data and Applying involve the ability to analyze and make sense of scientific information and then apply that knowledge to solve problems or make informed decisions. It involves identifying patterns, trends, relationships, and significant findings within the data. This skill enables learners to extract meaningful insights and draw conclusions based on the evidence provided by the data (Widyaningsih et al., 2020).

On the other hand, among the learners' proficiency in Science process skills and their cognitive performance, **Observing** and **Remembering** have the lowest rho-value of -0.0001 (p=0.999) described as **Not Significant**. This means that there is no meaningful or significant relationship between Observing and Remembering skills and learners' cognitive performance. The rho-value close to zero suggests a negligible or minimal association between these two variables. Meaning, the proficiency in Observing as a Science process skill does not significantly impact Remembering as a cognitive performance of the Grade V learners in the context of this study.

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As perceived, Observing as a Science process skill involves the ability to carefully and attentively gather information through sensory perception, while Remembering as a cognitive performance refers to the capacity to retain and recall information. Although these skills are fundamental in the scientific process and can contribute to certain aspects of scientific inquiry, such as data collection and retrieval of relevant knowledge, their impact towards each other appears to be minimal.

It is important to note that while Observing as a Science process skill may have no or limited impact on Remembering as a cognitive performance, they remain essential components of the scientific process. Developing strong observation and memory skills enables learners to accurately perceive and record scientific phenomena, recognize patterns, and recall relevant information during scientific investigations (DiTullio, 2021).

Additionally, among the Science Process skills, **Observing** (p=0.091), **Controlling Variables** (p=0.129), and **Hypothesizing** (p=0.086) were found not significant in terms of the relationship between Science Process Skills and Cognitive Performance of Grade V learners. The lack of a significant relationship between Observing, Controlling Variables, and Hypothesizing as Science process skills, and cognitive performance in Grade V learners suggests that the said Science process skills may not directly translate into improved cognitive performance across all domains. This could be because these Science process skills may indirectly influence the cognitive performance

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of Grade V learners by fostering in them the specific cognitive skills, such as problem-solving, critical thinking, and analytical reasoning.

As noticed, Science process skills (SPS) are essential for learning Science, but some skills such as Observing, Controlling Variables, and Hypothesizing may not directly improve the overall thinking skills of Grade V learners. This could be because these Science process skills and cognitive performances are related in a complex way. These Science process skills may help improve cognitive performance indirectly by developing specific thinking skills like problem-solving and critical thinking. However, these skills may not be directly measured by standard CP tests, which focus on basic skills like memory and vocabulary.

Standardized tests that measure thinking skills often focus on basic abilities like remembering facts, understanding words, and thinking quickly. However, these tests may not accurately measure more complex thinking skills, such as observing details, controlling variables in experiments, and forming hypotheses. These complex thinking skills are important for Science, but they may not be directly assessed by standardized tests (Azevedo et al., 2019).

Significantly, the lack of a significant relationship between observing and cognitive performance suggests that simply emphasizing observation in Science instruction may not be enough to enhance overall cognitive abilities. While observing is a fundamental Science

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process skill, it may not directly translate into improved memory, understanding, application, evaluation, synthesis, or creativity. This further suggests that educators need to rethink the way they teach Science. Instead of simply emphasizing observation, educators should focus on teaching students how to use their observing skills to develop other cognitive skills (Kashin, 2022). This could include teaching students how to ask questions, design experiments, and analyze data.

Additionally, this study also found that there is no significant relationship between Controlling Variables and overall cognitive performance of Grade V public school learners. The implications of a lack of a significant relationship between controlling variables and the overall cognitive performance of Grade V public school learners can be the insufficient emphasis on cognitive strategies. If controlling variables do not significantly impact cognitive performance, it may indicate that educators are not effectively teaching students how to use cognitive strategies (Shi & Qu, 2021). This could lead to students struggling with complex tasks, difficulty in understanding and applying new concepts, and limited progress in their academic development.

Moreover, the results also show that there is no significant relationship between Hypothesizing and the overall cognitive performance of Grade V public school learners. This suggests that while hypothesis formulation is valuable, its direct impact on cognitive performance may be limited in the context of this study. This result implies that other

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factors may be more influential in determining cognitive performance in Grade V public school learners.

Significantly, the skill of hypothesis formulation is indeed valuable in various areas of life, such as business, where it can help inform decision-making (Majaski, 2023). For students, learning to formulate hypotheses is essential because it helps them develop critical thinking skills and understand how scientific knowledge is generated. By formulating hypotheses, students learn how to identify variables, make predictions, and design experiments to test their hypotheses, which in turn helps them develop a deeper understanding of the scientific method and become more effective at conducting scientific research.

IV. CONCLUSION/RECOMMENDATION/FINDINGS/SUMMARY

Summary

This study endeavored to determine the learners' level of proficiency in Science process skills and their cognitive performance in Science in Manolo Fortich, Bukidnon during the School Year 2023-2024. Specifically, this study aimed to find out the learners' level of proficiency in Science process skills based on Observing, Measuring, Classifying, Predicting, Communicating, Controlling variables, Hypothesizing, Experimenting, and Interpreting Data; the respondents' level of cognitive performance as regards

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Remembering, Understanding, Applying, Analyzing, Evaluating and Creating; and the significant relationship between the respondents' proficiency level in Science Process Skills and their cognitive performance in Science. To gather the data to address these research questions, this study used a questionnaire of two parts, patterned and modified from self-learning modules and summative tests in Science. It has undergone reliability and validity tests, and distributed to the respondents who are the 150 Grade V learners in the aforesaid district of Bukidnon division.

This study used correlational method of research. The data collected were analyzed using mean score, frequency, percentage, and standard deviation to determine the level of the learners' level of proficiency in Science process skills and cognitive performance, and Spearman's Rho Correlation to determine the significant relationship between the learners' level of proficiency in Science process skills and their level of cognitive performance in Science.

Findings

The analysis showed the following findings:

1. The respondents' level of proficiency in Science process skills did not meet the expectations except for measuring and classifying skills, which are satisfactory.

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2. The respondents' level of cognitive performance in Science in all areas did not meet the expectations.
3. There is a significant relationship between the respondents' proficiency in Science process skills and their cognitive performance in Science except on Observing, Controlling Variables and Hypothesizing.

Conclusions

In the light of the findings found by the researcher, the research concluded that the Grade V learners' proficiency in Science process skills and their cognitive performance did not meet expectations. Moreover, the study reveals that there is a significant relationship between the learner's proficiency in Science process skills and their cognitive performance. Hence, the null hypothesis is rejected.

Recommendations

Based on the results of the study, the following are recommended:

1. To improve Hypothesizing, Observing and Controlling Variables as a Science Process Skill among Grade V learners, educators should focus on connecting these skills to real-world applications. They should be able to provide first-hand experiences for students to apply these skills to real-world situations and engage them in interactive learning activities that promote active learning to develop these skills.

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2. To improve cognitive performance among Grade V learners, particularly on evaluation, School Administrators and Education specialists should conduct training workshops for teachers on creating interactive learning experiences with the learners that encourage students to evaluate data, explore different perspectives, and draw informed conclusions.
3. Teachers should help students improve the Grade V learners' level of Science Process Skills and Cognitive Performance through sensemaking. Nurturing a sensemaking environment can help transform a Grade V Science classroom into a dynamic space where curiosity thrives and scientific understanding blossoms. With this, learners will be able to develop, test, and refine their ideas to gain meaningful learning.

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