



SCIENCE PROCESS SKILLS ON LEARNER'S METACOGNITION AND PERFORMANCE IN SCIENCE 10

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ABSTRACT

This study aims to determine the significant relationship of Science Process Skills to Learners' Metacognition and Performance in Science 10 students of Doña Pilar M. Alberto Integrated High School. It aimed to answer the questions such as the status of utilizing learner's science process skills, the level of the metacognition, the level of learner's performance, the significant relationship between science process skills to learner's metacognitions, and the significant effect of science process skills to the learner's performance in written and practical test.

Throughout the study, the researcher employed purposive sampling involving eighty (80) student respondents from three sections in Grade 10 of Doña Pilar M. Alberto Integrated High School with survey-questionnaire, written test and practical test as research instruments. Furthermore, the Mean and Standard Deviation were identified to analyze the gathered data while Pearson r correlation and multiple regression analysis were treated for their significant relationships.

From the study's data analysis, these findings were derived. It was found that the learners over all status of utilizing science process skills obtain very great extent. Data also showed learners' level of learner's metacognition obtain very great extent. Also, the research data showed that the level of learner's performance in terms of written test and practical test obtain very satisfactory. Moreover, the data showed science process skills were observed to have a significant relationship to the learner's metacognition. The result data also showed that science process skills have no significant effect on the learner's performance.

The following conclusion were drawn from the results of the study. Utilizing science process skills was observed to have a significant relationship to the learner's metacognition. Thus, signifies the rejection of null hypothesis as science process skills include intellectual skills, associated psychomotor and affective skills that are concerned with the learning of science in all its aspects. Meanwhile, the effect of utilizing science process skills on the learner's performance have no significant effect to the learner's performance. Thus, signifies the acceptance of null hypothesis.

It is recommended that the teachers can create educational opportunities that encourage inquiry-based learning, allowing students to participate actively in the scientific method. Motivate students to do experiments, gather information, evaluate it, and make decisions. Finally, Motivating the students to check their own learning with self-assessment exercises. Give students specific standards for achievement and give them guidance when assessing their own work in relation to these standards.

KEYWORDS: Science Process Skills; Learners' Metacognition; Performance

1. INTRODUCTION

Science Process Skills (SPS) at its core encompasses the ability to make accurate and meaningful observations, utilizing all the senses and scientific instruments available. Through careful observation, researchers identify patterns, detect anomalies, and formulate questions that serve as the foundation for further investigation.

Moreover, SPS emphasizes the importance of precise measurement and data collection, ensuring the reliability and validity of experimental outcomes. As far as level of student learning is concern, specifically in Science subject, getting involve into research as one of the process skills to be developed among students is indeed significant. In this manner, students can already show potential in doing research and learning the benefits of it.

This perception has driven the researcher to study the level of students' Science Process Skills to further enhance their potentials in learning and excel both in written and practical test. Furthermore, on students mastering these process skills will help them use and develop the kind of science program that

mirrors real science. A proposal classified SPS under two main categories – namely the basic SPS and integrated SPS – whereas the development of the former is to be considered as the necessary building block for the development of the latter. Having mastered the required skills for students will enable them to acquire knowledge and skills necessary for them to excel in the field.

According to Roa, G., et.al. (2022), it is knowing what to teach and how to learn were considered as two aspects of teaching and learning. More than just transferring knowledge, teaching, and learning about science also helps students become better problem solvers (Dauda et al., 2019).

Science process skills and metacognition are closely intertwined in the context of scientific inquiry. Developing metacognitive awareness can enhance students' use of science process skills, while proficiency in science process skills can, in turn, support the development of metacognitive abilities. Effective science instruction should aim to foster both science process skills and metacognition to promote deep understanding and proficiency in scientific thinking and inquiry. The importance of the science process skills not only



to meet the demands of learning science but also to the student's awareness of the importance of science in other subjects and human life. Therefore, the researcher believed that understanding the concept of science process skills and laboratory skills can help the student to improve their learning processes in science.

1.1 Statement of the Problem

Specifically, the study sought to achieve the following objectives:

1. What is the status of utilizing science process skills in terms of
 - 1.1. Statement of Problem;
 - 1.2. Observation;
 - 1.3. Hypothesis formulation;
 - 1.4. Experimentation; and
 - 1.5. Drawing conclusion?
2. What is the level of learner's metacognition in terms of
 - 2.1. Self-efficacy;
 - 2.2. Self-learning;
 - 2.3. Task Completion;
 - 2.4. Quality of Work; and
 - 2.5. Monitoring and Control?
3. What is the level of learner's performance in in terms of
 - 3.1. Written Test and
 - 3.2. Practical Test?
4. Is there a significant relationship between the status of utilizing science process skills and learner's metacognition?
5. Is there a significant effect on the status of utilizing science process skills on the learner's performance?

2. METHODOLOGY

The research design used in this study was a mixed method to determine the relationship between Science Process Skills to

Learner's Metacognition and Performance of Grade 10 Students in Science 10. Descriptive research is a research design in which data is collected in a qualitative manner and analyzed using quantitative procedures according to Nassaji (2015).

Descriptive research refers to the scientific methodology in which observation of the sampled population is carried out in its natural surroundings. This methodology intended to find 'what' is related to a phenomenon and data are collected qualitatively and analyzed through a quantitative method. Data is collected through methods like surveys, interviews, correlation study, observation study, or content analysis. Moreover, the observer does not intervene in this observation process or influence any of the variables of the study.

3. RESULTS AND DISCUSSION

This chapter enumerates the different results and discusses the results that were yielded from the treatment of the data that was gathered in this study. The following tabular presentations and discussions will further characterize the status of utilizing science process skills among students as well as their level of metacognition and performance both in written and practical test in Science 10.

Status of Utilizing Science Process Skills

In this study, the status of utilizing process skills teaching refer to the skills of the students which include statement of the problem, observation, hypothesis formulation, experimentation, and drawing conclusion. The status of utilizing science process skills was revealed in the following table, showing the statement, mean, standard deviation, and verbal interpretation.

Table 1 shows the status of utilizing science process skills in stating the problem observed.

Table 1 Status of Utilizing Science Process Skills in Terms of Statement of Problem

STATEMENTS	MEAN	SD	REMARKS
I ensure that the topic I aim to examine has a sufficient amount of relevant data.	4.38	0.51	Strongly Agree
I rely on reputable evidence and data and disregarding information that I can't verify.	4.36	0.48	Strongly Agree
I focus and make emphasis on the main problem encounter.	4.24	0.46	Strongly Agree
I develop a concise and clear problem statement that articulates the questions and inquiry.	4.39	0.49	Strongly Agree
I continuously iterate and refine the problem statement based on feedback and new insights.	4.45	0.55	Strongly Agree
Weighted Mean	4.36		
SD	0.44		
Verbal Interpretation	Very Great Extent		

Table 1 illustrates the status of utilizing Science process skills in terms of Statement of Problem. The learners' status of utilizing science process skills in terms of stating the problem obtain very great extent ($M=4.36, SD=0.44$). This indicates that learners based their problem statement from the data and observation they gathered from their surroundings and feedbacks.

The data shows that the respondents strongly agree ($M=4.45, SD=0.55$) that students continuously iterate and refine the problem statement based on feedback and new insights. This entails that learners put emphasis on the inquiry that is significant on their experiences perceived from the surroundings.



Often, the statement of the problem will also serve as the basis for the introductory section of your final proposal, directing your reader's attention quickly to the issues that your proposed project will address and providing the reader with a concise

statement of the proposed project itself. Table 2 shows the status of utilizing science process skills in terms of observation process.

Table 2 Status of Utilizing Science Process Skills in Terms of Statement of Observation

STATEMENTS	MEAN	SD	REMARKS
I pay close attention to fine details when observing objects or scenes.	4.35	0.51	Strongly Agree
I can able to perceive subtle changes in my environment	4.65	0.48	Strongly Agree
I can able to recognize patterns or trends based on my observations.	4.70	0.51	Strongly Agree
I can differentiate between relevant and irrelevant details when observing a situation.	4.45	0.50	Strongly Agree
I effectively communicate my observations to others.	4.24	0.43	Strongly Agree
Weighted Mean	4.48		
SD	0.38		
Verbal Interpretation	Very Great Extent		

Table 2 shows the status of utilizing Science process skills in terms of Observation.

The learners' status of utilizing science process skills in terms of observation obtain very great extent ($M=4.48, SD=0.38$). This indicates that learners observation from the environment plays a crucial roles in their science process skills. The data shows that the respondents strongly agree ($M=4.70, SD=0.51$) that students able to perceive subtle changes in my environment. This entails that the environment is one of the main factors contributing with the learners science process skills.

Observing is a habit that many people have. It aids us in making decisions such as whether it is safe to cross the street. However, observation goes beyond mere noticing. We become aware of something through our senses, which is perception. It also entails acknowledging the significance of what we are witnessing.

Table 3 shows the status of utilizing science process skills in terms of formulating hypothesis

Table 3 Status of Utilizing Science Process Skills in Terms of Hypothesis Formulation

STATEMENTS	MEAN	SD	REMARKS
I begin with a research question that I want to answer.	4.59	0.54	Strongly Agree
I look for theories and previous studies to help me form educated assumptions about what the research will find.	4.33	0.47	Strongly Agree
I make sure my hypothesis is specific and testable.	4.40	0.52	Strongly Agree
I make sure that first part of the sentence states the independent variable and the second part states the dependent variable.	4.18	0.38	Agree
I collect some background information about the topic.	4.36	0.48	Strongly Agree
Weighted Mean	4.37		
SD	0.41		
Verbal Interpretation	Very Great Extent		

Table 3 shows the status of utilizing Science process skills in terms of Hypothesis Formulation. The learners' status of utilizing science process skills in terms of formulating hypothesis obtain very great extent ($M=4.37, SD=0.41$). This indicates that learners based their hypothesis from the problem statements and questions.

It was cited in Kitas (2021) that hypothesis testing requires choosing the most appropriate methodology and adequately powering statistically the study to be able to "prove" or "disprove" it within predetermined and widely accepted levels of certainty. This entails sample size calculation that often considers previously published observations and pilot studies.

The data shows that the respondents strongly agree ($M=4.70, SD=0.51$) that students begin with a research question that they want to answer. This entails that the formulation of hypothesis depends on the statement of the problems and variables of the

study.

As cited Hugo Hernandez (2020), the present essay is intended as a brief explanation and a provocative discussion of the mechanism of hypothesis formulation and testing, used for the construction of human knowledge and the advance of Science. Simply stated, hypotheses are possible answers to a specific research question. The validity of those hypotheses can be tested, in principle, from the observation of experimental results.

Hypothesis essentially summarizes what and how something will be investigated. This is important as it ensures that the researcher has carefully planned how the research will be done, as the researchers have to follow a set procedure to conduct research.

Table 4 shows the status of utilizing science process skills in terms of experimentation.



Table 4 Status of Utilizing Science Process Skills in Terms of Experimentation

STATEMENTS	MEAN	SD	REMARKS
I can select appropriate materials, equipment, and instruments needed for the experiment	4.19	0.45	Agree
I can identify potential safety hazards associated with the experimentation.	4.36	0.53	Strongly Agree
I consider safety protocols and provide necessary protective equipment.	4.31	0.49	Strongly Agree
I manage time effectively to meet project deadlines and milestones.	4.29	0.46	Strongly Agree
I allocate sufficient time for conducting the experiment, data collection, and analysis.	4.34	0.50	Strongly Agree
Weighted Mean	4.30		
SD	0.42		
Verbal Interpretation	Very Great Extent		

Table 4 shows the status of utilizing science process skills in terms of Experimentation. The learners' status of utilizing science process skills in terms of experimentation obtain very great extent ($M=4.30$, $SD=0.42$). This indicates of contributing factor for the interest and meaningful learning of science.

The data shows that the respondents strongly agree ($M=4.34$, $SD=0.50$) that students allocate sufficient time for conducting the experiment, data collection, and analysis. This entails that learners applies self efficacy in doing experiments by following time procedures in executing the step by step process.

Furthermore, experimentation (especially the communicative one) is an important contributing factor for the interest and meaningful learning of science. Therefore, it recognizes the importance of inserting experimentation in a problematical way in science education at the elementary school, as well as perform a review on the subject using articles, laws, and national programs and parameters, as well as these resources relate to the Textbook and basic Education regarding to experimentation.

Table 5 shows the status of utilizing science process skills in terms of drawing conclusion based from the findings.

Table 5 Status of Utilizing Science Process Skills in Terms of Drawing Conclusion

STATEMENTS	MEAN	SD	REMARKS
I based my conclusion from the analysis and interpretation of data.	4.50	0.53	Strongly Agree
I clearly state the main findings and their implications for the field.	4.36	0.53	Strongly Agree
I regulate my time effectively to ensure I complete academic tasks on schedule.	4.56	0.50	Strongly Agree
I seek feedback from peers, mentors, or experts on my conclusions	4.44	0.52	Strongly Agree
I ensure that the conclusions are accurately conveyed and supported by evidence.	4.35	0.48	Strongly Agree
Weighted Mean	4.46		
SD	0.44		
Verbal Interpretation	Very Great Extent		

Table 5 presents the status of utilizing Science process skills in terms of Drawing Conclusion. The learners' status of utilizing science process skills in terms of drawing conclusion obtain very great extent ($M=4.46$, $SD=0.44$). This indicates that conclusion must be accurate and supported by importance evidences based for the main findings and implications.

The data shows that the respondents strongly agree ($M=4.50$, $SD=0.53$) that students based their conclusion from the analysis and interpretation of data. This entails that learners aligned their conclusion based form the clearly stated data findings and implication from the study. In terms of the kinds of conclusions

that can be drawn, a study and its results can be assessed in multiple ways.

Moreover, the integrated science process skills include manipulating and interpreting data, controlling variables, defining operationally, formulating a hypothesis, and experimenting.

Table 6 shows the composite table of the status of utilizing science process skills.



Table 6 Composite Table of Utilizing Science Process Skills

INDICATORS	WM	SD	V. I.
Statement of Problem	4.36	0.44	Very Great Extent
Observation	4.48	0.38	Very Great Extent
Hypothesis formulation	4.37	0.41	Very Great Extent
Experimentation	4.30	0.42	Very Great Extent
Drawing conclusion	4.46	0.44	Very Great Extent
Overall Mean	4.39		
SD	0.42		
Verbal Interpretation	Very Great Extent		

Table 6 verifies the composite table of utilizing Science process skills. The learners' over all status of utilizing science process skills in obtain very great extent (M=4.39, SD=0.42).

This indicates that when instructing students to apply these scientific abilities, we are also educating them on practical skills for the workplace in the future in all aspects of their lives. The data shows that the respondents strongly agree (M=4.48, SD=0.38) in terms of observation. This indicates that observation skills by the students are evident skills shown by the students.

Because science is about questioning, asking questions and obtaining responses we all possess these abilities use in our everyday lives as we attempt to understand ordinary inquiries. When instructing students to apply these scientific abilities, we

are also educating them on practical skills for the workplace in the future in all aspects of their lives.

These skills are important for students as tools for exploration and investigation of the natural world, improving academic achievements and attitudes towards science, and promoting development of mental processes.

Level of Learners' Metacognition

In this study, the level of learner's metacognition of the students which include self-efficacy, self-learning, task completion, quality of work, and monitoring and control.

Table 7 shows the level of learner's metacognition in terms of Self-efficacy

Table 7 Level of Learner's Metacognition in Terms of Self-efficacy

STATEMENTS	MEAN	SD	REMARKS
I am confident in my ability to deal with unexpected situations.	4.26	0.47	Strongly Agree
I am confident in my ability to succeed academically.	4.49	0.50	Strongly Agree
I believe I can understand and master complex subjects.	4.46	0.58	Strongly Agree
I am confident are that i can adapt to changes in my environment.	4.64	0.48	Strongly Agree
I can effectively manage my time and resources to achieve my goals.	4.54	0.50	Strongly Agree
Weighted Mean	4.48		
SD	0.28		
Verbal Interpretation	Very Great Extent		

Table 7 illustrates the level of of learner's metacognition in terms of Self-efficacy. The learners' level of learner's metacognition in terms of Self-efficacy obtain very great extent (M=4.48, SD=0.28).

This indicates that self-efficacy is important in managing the time in reaching goals and objectives in every activity and learning process.

The data shows that the respondents strongly agree (M=4.48, SD=0.38) that the students can adapt to their environment. This

indicates that self-efficacy is affected by the environment which is crucial in metacognition process.

Science self-efficacy on the other hand can predict students' science academic achievement. Students with a higher sense of science self-efficacy have more confidence in their abilities, a greater willingness to successfully complete science tasks, and a stronger perseverance in completing difficult tasks.

Table 8 shows the level of learner's metacognition in terms of Self-learning.

Table 8 Level of Learner's Metacognition in Terms of Self-learning

STATEMENTS	MEAN	SD	REMARKS
I am good at managing my time and resources to facilitate my self-learning.	4.41	0.50	Strongly Agree
I set clear learning goals for myself.	4.61	0.49	Strongly Agree
I can identify my preferred learning style and use it to my advantage.	4.51	0.53	Strongly Agree
I am persistent and resilient in the face of challenges and setbacks in my learning journey.	4.56	0.50	Strongly Agree



I can effectively utilize a variety of learning resources, including online courses, books, and other educational materials.	4.39	0.49	Strongly Agree
Weighted Mean	4.50		
SD	0.46		
Verbal Interpretation	Very Great Extent		

Table 8 shows the level of learner’s metacognition in terms of Self-learning. The learners’ level of learner’s metacognition in terms of Self-efficacy obtain very great extent (M=4.50, SD=0.46). This indicates that self-learning is important in individuals initiate self-directed learning to find solutions to concrete goals or real-world problems.

The data shows that the respondents strongly agree (M=4.61, SD=0.49) that students set clear learning goals for themselves. This entails that learners put emphasis on establishing goals and objectives as scaffold in their self-learning process.

It is also a process where individuals take primary charge of

planning, continuing and evaluating their learning experiences and develop them cognitively and metacognitively in order to direct them into their own way of learning. In the same manner, students will master their ability to self-directed processes which provide them equal opportunity to learn not only from the given concepts but also from their discovery along the processes. And also, having the students provided with varied learning resources expand their horizon on experimenting and discovering new concepts.

Table 9 shows the level of learner’s metacognition in terms of Task Completion

Table 9 Level of Learner’s Metacognition in Terms of Task Completion

STATEMENTS	MEAN	SD	REMARKS
I set clear goals before starting a task.	4.76	0.43	Strongly Agree
I can identify the strategies that work best for me when completing a task.	4.69	0.47	Strongly Agree
I am able to regulate my time effectively to complete tasks within deadlines.	4.60	0.49	Strongly Agree
I reflect on my task completion process to identify areas for improvement.	4.79	0.41	Strongly Agree
I seek feedback from others to gain different perspectives on my task completion.	4.70	0.46	Strongly Agree
Weighted Mean	4.71		
SD	0.42		
Verbal Interpretation	Very Great Extent		

Table 9 illustrates the level of learner’s metacognition in terms of Task Completion. The learners’ level of learner’s metacognition in terms of Self-efficacy obtain very great extent (M=4.50, SD=0.46). This indicates that it is important to select strategies that is effective in completing certain task.

The data shows that the respondents strongly agree (M=4.61, SD=0.49) that students set clear learning goals for themselves. This entails that learners focus and reflect on task completion process to identify areas for improvement.

Table 10 shows the level of learner’s metacognition in terms of the quality of work.

Table 10 Level of Learner’s Metacognition in Terms of Quality of Work

STATEMENTS	MEAN	SD	REMARKS
I regularly reflect on the quality of my work and identify areas for improvement.	4.59	0.52	Strongly Agree
I am aware of my own thinking processes and decision-making while producing work.	4.69	0.47	Strongly Agree
I consider different perspectives and approaches to improve the overall quality of my work.	4.48	0.50	Strongly Agree
I set specific metacognitive goals to improve the quality of my work.	4.79	0.41	Strongly Agree
I monitor and evaluate my metacognitive processes during the completion of tasks.	4.58	0.50	Strongly Agree
Weighted Mean	4.62		
SD	0.43		
Verbal Interpretation	Very Great Extent		



Table 10 shows the level of learner’s metacognition in terms of Quality of Work. The learners’ level of learner’s metacognition in terms of Quality of Work obtain very great extent (M=4.62, SD=0.43). This indicates that quality of work include decision-making process while doing the task and activities.

The data shows that the respondents strongly agree (M=4.79, SD=0.41) that students set specific metacognitive goals to improve the quality of my work. This entails that learners reflect on task completion process to identify areas for improvement. This entails that learners focus on the feedback in competing task.

Table 11 shows the level of learner’s metacognition in terms of the quality of work

Table 11 Level of Learner’s Metacognition in Terms of Monitoring and Control

STATEMENTS	MEAN	SD	REMARKS
I regularly monitor my progress when working on academic tasks.	4.89	0.32	Strongly Agree
I am aware of distractions that may hinder my academic performance and take steps to control them.	4.68	0.47	Strongly Agree
I regulate my time effectively to ensure I complete academic tasks on schedule.	4.85	0.35	Strongly Agree
I am confident in my ability to control my thought processes during challenging academic tasks.	4.61	0.49	Strongly Agree
I set specific goals for my academic tasks to guide my monitoring of progress.	4.49	0.50	Strongly Agree
Weighted Mean	4.71		
SD	0.25		
Verbal Interpretation	Very Great Extent		

Table 11 presents the level of learner’s metacognition in terms of Monitor and Control.

The learners’ level of learner’s metacognition in terms of Quality of Monitor and Control obtain very great extent (M=4.71, SD=0.25). This indicates that setting goals serve as a guide on monitoring their progress.

It somehow helps improve precision about evidence and provide convincing data to be reflected on students’ output. In monitoring students’ metacognition, existing state of knowledge can be monitored focusing on the accuracy at predicting own memory and problem-solving performance. This process plays a vital role in developing students’ self-regulated learning abilities.

The data shows that the respondents strongly agree (M=4.79, SD=0.41) that students regularly monitor their progress when working on academic tasks. This entails that learners control and monitor their work regularly using time frames and patterns in order to follow the pace of their learning process.

Metacognition is not separate from cognition, but integral to all higher-order cognitive inferences, including explicit learning, skill development, recall of personal events, communication, decision making, problem solving, navigation, design, etc.

Table 12 shows the composite table of learner’s metacognition.

Table 12 Composite Table of Learner’s Metacognition

INDICATORS	WM	SD	V. I.
Self-efficacy	4.48	0.28	Very Great Extent
Self-learning	4.50	0.46	Very Great Extent
Task Completion	4.71	0.42	Very Great Extent
Quality of Work	4.62	0.43	Very Great Extent
Monitoring and Control	4.71	0.25	Very Great Extent
Overall Mean	4.60		
SD	0.37		
Verbal Interpretation	Very Great Extent		

Table 12 verifies the composite table of learner’s metacognition. The learners’ level of learner’s metacognition obtains very great extent (M=4.60, SD=0.37).

This indicates that learner’s level of metacognition is significant in connection with their learning process. It helps them to think critically and improve their higher order thinking skills.

The data shows that the respondents strongly agree (M=4.71, SD=0.42) that task completion plays a significant role in learner’s metacognition. This entails that the quality of the learner’s outcome improves their level of metacognition in some aspects of learning process. Students with well-developed metacognition can identify concepts they do not understand and select appropriate strategies for learning those concepts. They know how to implement strategies they have selected and carry out their overall study plans. They can evaluate their strategies and adjust their plans based on outcomes.



Table 13 shows the level of learner’s performance in terms of written test.

Table 13 Level of Learner’s Performance in Terms of Written Test

Score	F	%	Descriptive Equivalent
41 - 50	19	23.75	Outstanding
31 - 40	60	75.00	Very Satisfactory
21 - 30	1	1.20	Satisfactory
11 - 20	0	0.00	Fairly Satisfactory
0 - 10	0	0.00	Did not meet Expectation
Total	80	100	
Weighted Mean	37.36		
SD	2.68		
Verbal Interpretation	Very Satisfactory		

Table 13 presents the level of learner’s performance in terms of Written Test. The level of learner’s performance in terms of Written Test obtain very satisfactory (M=4.60, SD=0.37).

This indicates that learner’s level of performance in terms of written test provide information on how the science process

skills affect student learner’s outcome.

Table 14 shows the level of learner’s performance in terms of practical test of students in science.

Table 14 Level of Learner’s Performance in Terms of Practical Test

Description	PT1			PT2			PT3			PT4			PT5		
	Me an	SD	VI	Mean	SD	VI	Me an	SD	VI	Mea n	SD	VI	Mea n	SD	VI
Scientific Content	3.89	0.32	VS	3.84	0.37	V S	3.9	0.3	VS	3.86	0.35	VS	3.89	0.32	VS
Experimental	3.55	0.5	VS	3.69	0.47	V S	3.65	0.48	VS	3.61	0.49	VS	3.61	0.49	VS
Data Collection	3.9	0.3	VS	3.79	0.41	V S	3.88	0.33	VS	3.81	0.39	VS	3.89	0.32	VS
Communication Results	3.51	0.5	VS	3.71	0.46	V S	3.68	0.47	VS	3.58	0.5	VS	3.64	0.49	VS
Scientific Inquiry	3.95	0.22	VS	3.83	0.38	V S	3.86	0.35	VS	3.87	0.35	VS	3.87	0.35	VS
	3.76	0.27	VS	3.77	0.42	V S	3.79	0.39	VS	3.75	0.42	VS	3.78	0.40	VS

Table 14 presents the level of learner’s performance in terms of Practical Test. The level of learner’s performance in terms of Written Test obtain very satisfactory (M=3.77, SD=0.38). This indicates that learner’s level of performance was affected by the science process skills in learning process.

For learners, it provides efficient learning by focusing the student’s attention on what is important. It promotes retention and transfer of learning, promotes self-evaluation and self monitoring by the use of well-defined expectations and criteria, motivates learning by communicating progress concerning what a student knows or is able to do, and it shows evidence of work that can be used to get a job, scholarships, and entrance to the next stage of schooling.

The data shows that the respondents very satisfactory (M=3.95, SD=0.22) that scientific inquiry plays an important role in the performance of student in practical examination. This entails

that engaging students in scientific inquiry is an important component of science instruction that helps students develop scientific literacy and provides them with the opportunity to practice important science process skills in addition to critical thinking and problem-solving skills.

Thus, there emerged different forms, like alternative, authentic and performance assessments, which are labeled the most suitable for assessing science process skills demonstrated and developed by students during science laboratory and classroom performances in science that will enhance the students understanding about the selected topic being discussed.

Table 15 shows the relationship between utilizing science process skills and learner’s metacognition



Table 15 Significant Relationship Between Utilizing Science Process Skills and Learner’s Metacognition

SCIENCE PROCESS SKILLS		METACOGNITION				
		Self-efficacy	Self-learning	Task Completion	Quality of Work	Monitoring and Control
Statement of Problem	Pearson Correlation	0.819	0.889	0.591	0.569	0.569
	Sig. (2-tailed)	0.000	0.000	0.000	0.000	0.000
	N	89	89	89	89	89
	Strength	<i>Very Strong</i>	<i>Very Strong</i>	<i>Moderate</i>	<i>Moderate</i>	<i>Moderate</i>
	Analysis	<i>Significant</i>	<i>Significant</i>	<i>Significant</i>	<i>Significant</i>	<i>Significant</i>
Observation	Pearson Correlation	0.862	0.919	0.821	0.737	0.737
	Sig. (2-tailed)	1	0.335	0.000	0.000	0.000
	N	89	89	89	89	89
	Strength			<i>Very Strong</i>	<i>Strong</i>	<i>Strong</i>
	Analysis	<i>NS</i>	<i>NS</i>	<i>Significant</i>	<i>Significant</i>	<i>Significant</i>
Hypothesis formulation	Pearson Correlation	0.797	0.918	0.649	0.548	0.548
	Sig. (2-tailed)	0.000	0.000	0.000	0.000	0.000
	N	89	89	89	89	89
	Strength	<i>Strong</i>	<i>Very Strong</i>	<i>Strong</i>	<i>Moderate</i>	<i>Moderate</i>
	Analysis	<i>Significant</i>	<i>Significant</i>	<i>Significant</i>	<i>Significant</i>	<i>Significant</i>
Experimentation	Pearson Correlation	0.734	0.814	0.529	0.421	0.421
	Sig. (2-tailed)	0.000	0.000	0.000	0.000	0.000
	N	89	89	89	89	89
	Strength	<i>Strong</i>	<i>Very Strong</i>	<i>Moderate</i>	<i>Moderate</i>	<i>Moderate</i>
	Analysis	<i>Significant</i>	<i>Significant</i>	<i>Significant</i>	<i>Significant</i>	<i>Significant</i>
Drawing conclusion	Pearson Correlation	0.859	0.963	0.873	0.705	0.705
	Sig. (2-tailed)	0.59	0.012	0.000	0.000	0.000
	N	89	89	89	89	89
	Strength		<i>Very Strong</i>	<i>Very Strong</i>	<i>Strong</i>	<i>Strong</i>
	Analysis	<i>NS</i>	<i>Significant</i>	<i>Significant</i>	<i>Significant</i>	<i>Significant</i>

Table 15 demonstrates the significant relationship between the utilizing science process skills and learner’s metacognition. Science process skills in terms of statement of the problem, observation, hypothesis formulation, experimentation, and drawing conclusion were observed to have a significant relationship to the learner’s metacognition in terms of self-efficacy, self-learning, task completion, quality of work, and monitoring and control.

This is based on the computed r values obtained from the tests with moderate to very strong relationship. Furthermore, the p-values obtained were less than the significance alpha 0.05, hence there is a significance.

This implies that science process skills are a reflection of the methods used by scientists while generating information on science. The science process skills include intellectual skills, associated psychomotor and affective skills that are concerned with the learning of science in all its aspects. Self-efficacy affects choice of activities, effort and persistence. People holding low self-efficacy for accomplishing a task may avoid it; those who believe they are capable are likely to participate. Especially when they encounter difficulties, efficacious students work harder and persist longer than those with doubts. These skills play a major role in learning processes of the students in science. It may help them to develop their own level of higher order thinking skills.

Table 16 shows the regression analysis on the status of utilizing science process skills on the learner’s performance.



Table 16 Regression Analysis on the Status of Utilizing Science Process Skills on the Learner's Performance

Written Test	B	SE	β	t	p
Constant	37.75	3.883		9.723*	0.000
Statement of Problem		3.174	1.725	0.543	0.589
Observation		2.353	-2.46	-1.04	0.3
Hypothesis formulation		2.9	-2.11	-0.73	0.47
Experimentation		2.813	-1.66	-0.59	0.557
Drawing conclusion		2.818	4.354	1.545	0.127
R-squared			.06		
Adjusted R-squared			-.000		
Standard Error of the Estimate		2.687			
F(5, 74)				.946	.457
Practical Test	B	SE	β	t	p
Constant	99.04	3.782		26.19*	0.000
Statement of Problem		3.092	-1.49	-0.48	0.632
Observation		2.292	-1.3	-0.57	0.571
Hypothesis formulation		2.825	-1.5	-0.53	0.598
Experimentation		2.741	-0.06	-0.02	0.982
Drawing conclusion		2.745	3.187	1.161	0.249
R-squared			.041		
Adjusted R-squared			-.02		
Standard Error of the Estimate		2.618			
F(5, 74)				0.634	.675

*p < 0.05

Table 16 presents the results of a multiple regression analysis examining the effect of utilizing science process skills on the learner's performance. This indicates that Statement of Problem, Observation, Hypothesis Formulation, Experimentation and Drawing conclusion have no significant effect on the learner's performance.

The F-test of the overall model is not significant (F(5, 74) with, $p > 0.05$), indicating that the regression model is not a good fit for the data. This implies that Science process skills simplify the learning of science, motivate the students, foster a sense of responsibility among them with respect to learning, enhance the permanency of learning.

4. CONCLUSION AND RECOMMENDATIONS

This study aimed to determine the relationship between Science Process Skills on Learner's Metacognition. In addition, it also determined the significant effect of science process skills to the learner's performances. With this, the following conclusion were drawn from the results of the study:

Utilizing science process skills was observed to have a significant relationship to the learner's metacognition. Thus, signifies the rejection of null hypothesis as science process skills include intellectual skills, associated psychomotor and affective skills that are concerned with the learning of science in all its aspects. Self-efficacy affects choice of activities, effort and persistence. Metacognitive skills and critical thinking skills have a positive correlation with process skills because the students' science process skills will be maximal if their metacognitive skills, as the control of the high order thinking, and the critical thinking skills are optimally developed, which is considered essential.

Meanwhile, the effect of utilizing science process skills on the learner's performance have no significant effect to the learner's performance. Thus, signifies the acceptance of null hypothesis.

Development and acquisition of science process skills (SPS) in science education are closely linked to the development of 21st-century skills and improvements in academic performance. To help facilitate the development of SPS in learners, teachers should acquire and exhibit SPS

Based on the results and conclusion posted in the study, the following recommendations were formulated:

1. Teachers may create educational opportunities that encourage inquiry-based learning, allowing students to participate actively in the scientific method.
2. Teachers and other stakeholders may put into practice project-based learning programs that mandate long-term, multidisciplinary projects from the students.
3. School Academic Organization may share teaching practices and gain a deeper understanding of science process skills through continuous professional development opportunities.
4. Teacher may motivate students to check their own learning with self-assessment exercises. Give students specific standards for achievement and give them guidance when assessing their own work in relation to these standards.

REFERENCE

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