

Primer for Equipment Handling in Science Classroom towards Students' Performance

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Abstract

This study determined the significant effect of the primer and equipment handling to students' performance. Specifically, it sought to answer the level of components of a primer; the level of features of a primer; the level of students' performance; the significant effect between the level of components and features of a primer and written test; the significant effect between the level of components and features of a primer and laboratory tasks.

The research design use descriptive - quantitative method to investigate the benefits of a Primer for Equipment Handling of the forty (40) eighth grader students based on components and features of the primer. The respondents of the study were the STE8 students of Gulang – Gulang to test the effectiveness of using a Primer for Equipment Handling. In this study, purposive sampling method was used in choosing the respondents. The researcher made questionnaires validated by different experts. The study was conducted in the District of Lucena City, Schools Division of Lucena.

Based on the data presented and interpreted, the statistical data revealed that most of the students shown: "Very High" as interpretation on the level of components of a primer; "Very Highly" as interpretation on the level of features of a primer; for the students' performance, it shows that the level of performance in their written test has a descriptive equivalent of "Very Satisfactory or High". Respondents also show a descriptive equivalent of Excellent on the level of students' performance in their laboratory tasks. This means that using a primer for equipment handling helped the students to increase students' performance in science class.

The study found that using a primer had a significant effect on students' written test performance. This means that the hypothesis stating there is no significant effect between the level of components and features of a primer and students' written test scores is rejected. However, the use of a primer did not have a significant effect on students' laboratory tasks. This means the hypothesis that there is no significant effect between the level of components and features of a primer and students' laboratory tasks is accepted. The primer's content is thorough and well-presented, but it may not directly relate to the practical skills and knowledge needed for laboratory tasks. Other factors such as individual learning styles, prior experience, or challenges during lab work might have a greater influence on students' performance. Further investigation is needed to identify specific gaps or adjustments in the primer to better assist students in their lab tasks.

Based on the conclusions formulated from the findings, the following recommendations were given; the teachers may provide real-world examples and to motivate more the students to use their cognitive abilities in laboratory settings. In order to help students, apply the knowledge and abilities they have learned from introductory handbooks, create collaborative learning environments; offer training sessions or workshops to familiarize students with the primer handbook and its features, emphasizing its role in enhancing laboratory skills and performance; and regularly assess the effectiveness of the primer handbook in improving students' laboratory skills and performance. Gather feedback from students and instructors regarding the usability, relevance, and impact of the handbook, and make necessary adjustments based on the findings.

Keywords: Primer handbook; performance; laboratory task

1. Introduction

In the fast-paced world of scientific discovery, laboratories serve as the birthplace of innovative research. Since it enables scientists to conduct exact tests, gather precise data, and unravel cosmic mysteries, the appropriate use of high-tech tools and equipment is a crucial element of laboratory work.

A seamless fusion of technical skills, real-world experience, and specialized knowledge is required to master the art of using laboratory instruments, however, and not just academic knowledge.

Proficiency with laboratory tools and equipment is essential for both the security and effectiveness of lab operations as well as the growth of scientific knowledge. Unfortunately, there is still a big gap between theoretical knowledge gained via formal schooling and the actual skills required for confident and precise laboratory work. This knowledge-practice gap is a significant barrier to scientific advancement and prevents researchers, students, and laboratory staff from realizing their full potential.

In line with the implementation of Republic Act No. 10533, or the Enhanced Basic Education Act of 2013 (Official Gazette, 2013), the Department of Education (DepEd) issues the enclosed policy on “The Learning Action Cell (LAC) as a K to 12 Basic Education Program School-Based Continuing Professional Development Strategy for the Improvement of Teaching and Learning” (DepEd, 2016), the DepEd fully supports the continuing professional development of its teaching personnel based on the principle of lifelong learning and DepEd’s commitment to the development of teachers potential aimed towards their success in the profession. This can be done through the school-based LAC, which primarily functions as a professional learning community for teachers that will help them improve practice and learner achievement.

Laboratory experiences are crucial to junior high school (JHS) students' education in the quest of scientific information and the growth of critical thinking abilities. Young brains have a special opportunity to engage in practical investigation and experimentation during these formative years, which helps them understand scientific principles and practices better. However, it is essential that students gain not only the theoretical knowledge but also the practical skills required to negotiate the complicated world of scientific apparatus if they are to fully realize the educational potential of laboratory work.

The primary aim of this thesis is to bridge this knowledge-practice gap by developing a comprehensive manual that empowers learners with the necessary skills to handle laboratory tools and equipment with finesse. By delving into the multifaceted factors that influence proficiency, we seek to unravel the intricacies of effective training methods, the impact of experience and access to resources, the role of practice and guidance, and the significance of personal motivation and cognitive abilities in mastering laboratory instrument manipulation.

It also essential that students gain not only the theoretical knowledge but also the practical skills.

1.1 Statement of the Problem

As a result, the research aimed to respond to the following questions:

1. What is the level of component of a primer for equipment handling in terms of:
 - 1.1 Objective;
 - 1.2 Equipment Overview;
 - 1.3 Safety Guidelines;
 - 1.4 Equipment Handling;
 - 1.5 Maintenance and Cleaning; and
 - 1.6 Emergency Procedures
2. What is the level of the features of a primer for equipment handling in terms of:
 - 2.1 Organization;
 - 2.2 Design;
 - 2.3 Clarity;

- 2.4 Visual Presentation; and
- 2.5 Relevance
- 3. What is the level of students' performance in terms of:
 - 3.1 Written test; and
 - 3.2 Laboratory task
- 4. Is there a significant effect on the level of primer for equipment handling and students' written test?
- 5. Is there a significant effect on the level of primer for equipment handling and students' laboratory task?

2. Methodology

The research design use descriptive - quantitative method to investigate the benefits of a Primer for Equipment Handling of the eighth grader students based on components and features of the handbook.

Descriptive research is a scientific methodology in which the sampled population is observed in its natural settings. This methodology is used to determine 'what' is related to a phenomenon, and data is collected qualitatively and examined quantitatively.

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 primer for equipment handling of eight grader STE students in Science Classroom.

Table 1. Level of component of a primer for equipment handling of JHS students in terms of objectives

STATEMENTS	MEA N	SD	REMARKS
<i>The handbook effectively communicates the purpose it serves.</i>	4.70	0.46	Strongly Agree
<i>The handbook clearly states the objectives of each topic.</i>	4.63	0.49	Strongly Agree
<i>The objectives presented in the handbook are relevant and essential for the intended audience.</i>	4.78	0.52	Strongly Agree
<i>The objectives are consistent with the content and information provided.</i>	4.70	0.46	Strongly Agree
<i>The handbook's objectives are appropriately prioritized and emphasized.</i>	4.68	0.67	Strongly Agree
Weighted Mean	4.70		
SD	0.26		
Verbal Interpretation	Very High		

Table 1 illustrates the level of component of a primer for equipment handling of JHS students in terms of objectives.

From the statements above, the students strongly agreed that primer for equipment handling “*presented in the handbook are relevant and essential for the intended audience*” yielded the highest mean score ($M=4.78$, $SD=0.52$) and was remarked as Strongly Agree. On the other hand, the handbook for equipment handling “*clearly states the objectives of each topic*” received the lowest mean score of responses with ($M=4.63$, $SD=0.49$) yet was also remarked Strongly Agree.

The level of component of a primer for equipment handling of JHS students in terms of objectives attained a weighted mean score of 4.70 and a standard deviation of 0.26 and was Very High among the respondents.

In summary, learning objectives, also known as targets, are statements that specify the knowledge and skills that students should acquire. It needs to be understandable and accurately represent the variety of topics and abilities that are stressed.

Table 2. Level of component of a primer for equipment handling of JHS students in terms of equipment overview

STATEMENTS	MEAN	SD	REMARKS
<i>The overview section provides a clear and concise description of the equipment.</i>	4.83	0.38	Strongly Agree
<i>The handbook effectively communicates the purpose and functionality of the equipment.</i>	4.78	0.42	Strongly Agree
<i>The overview section includes clear and labeled diagrams or images of the equipment.</i>	4.70	0.46	Strongly Agree
<i>The review section provides information on the components and parts of the equipment.</i>	4.85	0.36	Strongly Agree
<i>Overall, the equipment overview section in the handbook is well-organized and informative.</i>	4.73	0.45	Strongly Agree
Weighted Mean	4.78		
SD	0.22		
Verbal Interpretation	Very High		

Table 2 illustrates the level of component of a primer for equipment handling of JHS students in terms of equipment overview.

From the statements above, the students strongly agreed that primer for equipment handling “*review section provides information on the components and parts of the equipment*” yielded the highest mean score ($M=4.85$, $SD=0.36$) and was remarked as Strongly Agree. On the other hand, the handbook for equipment handling “*overview section includes clear and labeled diagrams or images of the equipment*” received the lowest mean score of responses with ($M=4.70$, $SD=0.46$) yet was also remarked Strongly Agree.

The level of component of a primer for equipment handling of JHS students in terms of equipment overview attained a weighted mean score of 4.78 and a standard deviation of 0.22 and was Very High among the respondents.

An equipment overview is a useful tool for anyone who has to use or comprehend the equipment. It promotes a better understanding of the capabilities and constraints of the equipment and assures its safe and effective use.

Table 3. Level of component of a primer for equipment handling of JHS students in terms of safety guidelines

STATEMENTS	MEAN	SD	REMARKS
<i>The safety guidelines in the handbook are clearly stated and easy to understand.</i>	4.75	0.44	Strongly Agree
<i>The safety guidelines cover all relevant safety measures related to the equipment or procedures.</i>	4.75	0.44	Strongly Agree
<i>The handbook effectively communicates the importance of adhering to safety guidelines.</i>	4.80	0.41	Strongly Agree
<i>The safety guidelines are practical and feasible to be implemented in real-world situations.</i>	4.65	0.48	Strongly Agree
<i>The safety guidelines include emergency procedures and contacts in case of accidents or incidents.</i>	4.65	0.48	Strongly Agree
Weighted Mean	4.72		
SD	0.24		
Verbal Interpretation	Very High		

Table 3 illustrates the level of component of a primer for equipment handling of JHS students in terms of safety guidelines.

From the statements above, the students strongly agreed that primer for equipment handling “*effectively communicates the importance of adhering to safety guidelines*” yielded the highest mean score ($M=4.80$, $SD=0.41$) and was remarked as Strongly Agree. On the other hand, the handbook for equipment handling “*with safety guidelines are practical and feasible to be implemented in real-world situations and include emergency procedures and contacts in case of accidents or incidents*” received the lowest mean score of responses with ($M=4.65$, $SD=0.48$) yet was also remarked Strongly Agree.

The level of component of a primer for equipment handling of JHS students in terms of safety guidelines attained a weighted mean score of 4.72 and a standard deviation of 0.42 and was Very High among the respondents. In order to enhance safety, avoid accidents, and reduce risks in a variety of settings and circumstances, safety guidelines are important collections of rules and recommendations.

Table 4. Level of component of a primer for equipment handling of JHS students in terms of equipment handling

STATEMENTS	MEAN	SD	REMARKS
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	N		
<i>The equipment handling procedures are documented.</i>	4.70	0.46	Strongly Agree
<i>The procedures for equipment handling are easy to understand.</i>	4.63	0.49	Strongly Agree
<i>The handbook effectively communicates safe equipment handling practices.</i>	4.73	0.45	Strongly Agree
<i>The procedures provide clear guidance on equipment setup, operation, and maintenance.</i>	4.75	0.44	Strongly Agree
<i>The equipment handling procedures are practical and can be easily applied in real-world situations.</i>	4.75	0.44	Strongly Agree
Weighted Mean	4.71		
SD	0.24		
Verbal Interpretation	Very High		

Table 4 illustrates the level of component of a primer for equipment handling of JHS students in terms of equipment handling

From the statements above, the students strongly agreed that primer for equipment handling “procedures provide clear guidance on equipment setup, operation, and maintenance and are practical and can be easily applied in real-world situations” yielded the highest mean score ($M=4.75$, $SD=0.44$) and was remarked as Strongly Agree. On the other hand, the handbook for equipment handling “procedures are easy to understand” received the lowest mean score of responses with ($M=4.63$, $SD=0.49$) yet was also remarked Strongly Agree.

The level of component of a primer as a handbook for equipment handling of JHS students in terms of equipment handling attained a weighted mean score of 4.71 and a standard deviation of 0.24 and was Very High among the respondents.

Working in a laboratory environment requires careful handling of laboratory equipment. Personnel safety, experiment integrity, and equipment longevity are all guaranteed by proper handling. Maintaining a secure and effective workplace requires proper handling of laboratory equipment. Additionally, it enhances the precision and dependability of scientific studies and investigations.

Table 5. Level of component of a primer for equipment handling of JHS students in terms of maintenance and cleaning

STATEMENTS	MEAN	SD	REMARKS
	N		
<i>The maintenance and cleaning instructions in the handbook are articulated and easy to follow.</i>	4.75	0.49	Strongly Agree
<i>The instructions cover all necessary maintenance tasks and cleaning procedures</i>	4.70	0.46	Strongly

<i>for the equipment or area.</i>			Agree
<i>The handbook effectively communicates the importance of regular maintenance and cleaning.</i>	4.65	0.48	Strongly Agree
<i>The maintenance and cleaning instructions are practical and can be easily applied in real-world situations.</i>	4.70	0.46	Strongly Agree
<i>The instructions include any safety precautions or protective measures required during maintenance and cleaning.</i>	4.85	0.36	Strongly Agree
Weighted Mean	4.73		
SD	0.23		
Verbal Interpretation	Very High		

Table 5 illustrates the level of component of a primer for equipment handling of JHS students in terms of maintenance and cleaning.

The students strongly agreed that primer for equipment handling “instructions include any safety precautions or protective measures required during maintenance and cleaning.” yielded the highest mean score ($M=4.85$, $SD=0.36$) and was remarked as Strongly Agree. On the other hand, the handbook for equipment handling “effectively communicates the importance of regular maintenance and cleaning” received the lowest mean score of responses with ($M=4.65$, $SD=0.48$) yet was also remarked Strongly Agree.

The level of component of a primer for equipment handling of JHS students in terms of maintenance and cleaning attained a weighted mean score of 4.73 and a standard deviation of 0.23 and was Very High among the respondents.

Maintaining a safe, effective, and productive laboratory environment requires constant upkeep. By keeping tools, facilities, and workplaces in good shape, proper maintenance lowers the possibility of accidents and preserves the precision and dependability of experiments. The integrity of research and experiments, as well as the safety of the staff, depend on proactive laboratory upkeep.

Table 6. Level of component of a primer for equipment handling of JHS students in terms of emergency procedures

STATEMENTS	MEA N	SD	REMARKS
<i>The emergency procedures in the handbook are clearly outlined and easy to understand.</i>	4.80	0.41	Strongly Agree
<i>The procedures cover a wide range of potential emergencies and crises that could occur.</i>	4.68	0.47	Strongly Agree
<i>The handbook effectively communicates the importance of knowing and following emergency procedures.</i>	4.73	0.45	Strongly Agree

<i>The handbook includes visual aids or diagrams to illustrate emergency response procedures.</i>	4.68	0.47	Strongly Agree
<i>The procedures include any safety precautions or protective measures to take during emergencies.</i>	4.78	0.42	Strongly Agree
Weighted Mean	4.73		
SD	0.22		
Verbal Interpretation	Very High		

Table 6 illustrates the level of component of a primer for equipment handling of JHS students in terms of emergency procedures.

From the statements above, the students strongly agreed that primer for equipment handling “*emergency procedures in the handbook are clearly outlined and easy to understand*” yielded the highest mean score ($M=4.80$, $SD=0.41$) and was remarked as Strongly Agree. On the other hand, the handbook for equipment handling “*procedures cover a wide range of potential emergencies and crises that could occur*” received the lowest mean score of responses with ($M=4.68$, $SD=0.47$) yet was also remarked Strongly Agree.

The level of component of a primer for equipment handling of JHS students in terms of emergency procedures attained a weighted mean score of 4.73 and a standard deviation of 0.22 and was Very High among the respondents.

Table 7. Level of features of a primer for equipment handling of JHS students in terms of organization

STATEMENTS	MEAN	SD	REMARKS
<i>The handbook is well-organized, with a clear structure and logical flow of content.</i>	4.75	0.44	Strongly Agree
<i>The table of contents provides a comprehensive overview of the handbook's sections and topics.</i>	4.68	0.47	Strongly Agree
<i>The handbook effectively uses headings, subheadings, and formatting to guide readers through the content.</i>	4.65	0.48	Strongly Agree
<i>The content is presented in a logical and sequential order, making it easy to follow.</i>	4.80	0.41	Strongly Agree
<i>The handbook includes a clear introduction that outlines its purpose and scope.</i>	4.75	0.44	Strongly Agree
Weighted Mean	4.73		
SD	0.22		
Verbal Interpretation	Very High		

Table 7 illustrates the level of features of a primer for equipment handling of JHS students in terms of organization.

From the statements above, the students strongly agreed that primer for equipment handling “*content is presented in a logical and sequential order, making it easy to follow*” yielded the highest mean score ($M=4.80$, $SD=0.41$) and was remarked as Strongly Agree. On the other hand, the handbook for equipment handling “*effectively uses headings, subheadings, and formatting to guide readers through the content*” received the lowest mean score of responses with ($M=4.65$, $SD=0.48$) yet was also remarked Strongly Agree.

The level of features of a primer for equipment handling of JHS students in terms of organization attained a weighted mean score of 4.73 and a standard deviation of 0.22 and was Very High among the respondents.

Effective organization of a handbook is essential to ensuring that the information it provides is readily available and understandable to the intended audience.

Table 8. Level of features of a primer for equipment handling of JHS students in terms of design

STATEMENTS	MEAN	SD	REMARKS
<i>The handbook's overall design is visually appealing and engaging.</i>	4.70	0.46	Strongly Agree
<i>The choice of colors, fonts, and layout contributes to a professional and aesthetically pleasing design.</i>	4.68	0.47	Strongly Agree
<i>Visual elements (e.g., images, diagrams, illustrations) are high-quality and they enhance the design.</i>	4.88	0.33	Strongly Agree
<i>The handbook includes a clear and visually appealing cover page that conveys its purpose.</i>	4.73	0.45	Strongly Agree
<i>The design choices are aligned with the intended audience and purpose of the handbook.</i>	4.73	0.45	Strongly Agree
Weighted Mean	4.74		
SD	0.20		
Verbal Interpretation	Very High		

Table 8 illustrates the level of features of a primer for equipment handling of JHS students in terms of design.

The students strongly agreed that primer for equipment handling “Visual elements (e.g., images, diagrams, illustrations) are high-quality and they enhance the design” yielded the highest mean score ($M=4.88$, $SD=0.33$) and was remarked as Strongly Agree. On the other hand, the handbook for equipment handling “choice of colors, fonts, and layout contributes to a professional and aesthetically pleasing design” received the lowest mean score of responses with ($M=4.68$, $SD=0.47$) yet was also remarked Strongly Agree.

The level of features of a primer for equipment handling of JHS students in terms of design attained a weighted mean score of 4.74 and a standard deviation of 0.20 and was Very High among the respondents.

The aim of the design of the handbook is to enhanced comprehension, engagement, and satisfaction among students and it must be clear.

Table 9. Level of features of a primer for equipment handling of JHS students in terms of clarity

STATEMENTS	MEAN	SD	REMARKS
<i>The language used in the handbook is clear and easy to understand.</i>	4.78	0.42	Strongly Agree
<i>Concepts and ideas are presented in a straightforward and understandable manner.</i>	4.63	0.49	Strongly Agree
<i>The handbook uses examples or practical scenarios to illustrate key points.</i>	4.80	0.41	Strongly Agree
<i>Each section or chapter begins with a clear and informative overview or summary.</i>	4.70	0.46	Strongly Agree
<i>The handbook's structure and organization contribute to the overall clarity of the content.</i>	4.78	0.42	Strongly Agree
Weighted Mean	4.74		
SD	0.23		
Verbal Interpretation	Very High		

Table 9 illustrates the level of features of a primer for equipment handling of JHS students in terms of clarity.

From the statements above, the students strongly agreed that primer for equipment handling “*uses examples or practical scenarios to illustrate key points*” yielded the highest mean score ($M=4.80$, $SD=0.41$) and was remarked as Strongly Agree. On the other hand, the handbook for equipment handling “*Concepts and ideas are presented in a straightforward and understandable manner*” received the lowest mean score of responses with ($M=4.63$, $SD=0.49$) yet was also remarked Strongly Agree.

The level of features of a primer for equipment handling of JHS students in terms of clarity attained a weighted mean score of 4.74 and a standard deviation of 0.23 and was Very High among the respondents.

Clarity is crucial when designing a handbook so that readers can access and understand the material being offered. To successfully convey information and make sure that the intended audience can understand and use the content, handbook design must be clear. It improves the entire user experience and makes the handbook's intended use—whether for informational, instructional, or reference purposes—more convenient.

Table 10. Level of features of a primer for equipment handling of JHS students in terms of visual presentation

STATEMENTS	MEAN	SD	REMARKS
<i>The handbook's graphic design is visually</i>	4.78	0.42	Strongly

<i>appealing and engages the reader.</i>			Agree
<i>The use of colors, fonts, and layout enhances the overall visual appeal of the handbook.</i>	4.83	0.38	Strongly Agree
<i>Visual elements (e.g., images, diagrams, illustrations) are high-quality and effectively support the content.</i>	4.68	0.47	Strongly Agree
<i>Visual aids are strategically placed to enhance understanding and engagement.</i>	4.68	0.47	Strongly Agree
<i>The visual presentation enhances the overall user experience and engagement with the content.</i>	4.73	0.45	Strongly Agree
Weighted Mean	4.74		
SD	0.22		
Verbal Interpretation	Very High		

Table 10 illustrates the level of features of a primer for equipment handling of JHS students in terms of visual presentation.

From the statements above, the students strongly agreed that primer for equipment handling “*use of colors, fonts, and layout enhances the overall visual appeal of the handbook*” yielded the highest mean score ($M=4.83$, $SD=0.38$) and was remarked as Strongly Agree. On the other hand, the handbook for equipment handling “*Visual elements (e.g., images, diagrams, illustrations) are high-quality and effectively support the content and visual aids are strategically placed to enhance understanding and engagement*” received the lowest mean score of responses with ($M=4.68$, $SD=0.47$) yet was also remarked Strongly Agree.

The level of features of a primer for equipment handling of JHS students in terms of visual presentation attained a weighted mean score of 4.74 and a standard deviation of 0.22 and was Very High among the respondents.

Visual presentation in handbook design should be to improve reader comprehension, engagement, and experience in general.

Table 11. Level of features of a primer for equipment handling of JHS students in terms of relevance

STATEMENTS	MEAN	SD	REMARKS
<i>The content of the handbook is directly relevant to its intended purpose or audience.</i>	4.83	0.38	Strongly Agree
<i>The handbook addresses the specific needs and challenges of its target audience effectively.</i>	4.63	0.49	Strongly Agree
<i>The content is tailored to the level of knowledge or experience expected from the readers.</i>	4.73	0.45	Strongly Agree

<i>The handbook provides practical and actionable information that users can apply in real-world situations.</i>	4.65	0.48	Strongly Agree
<i>The handbook's relevance is maintained throughout, from the introduction to the conclusion.</i>	4.88	0.33	Strongly Agree
Weighted Mean	4.75		
SD	0.25		
Verbal Interpretation	Very High		

Table 11 illustrates the level of features of a primer for equipment handling of JHS students in terms of relevance.

From the statements above, the students strongly agreed that primer for equipment handling “*relevance is maintained throughout, from the introduction to the conclusion*” yielded the highest mean score ($M=4.88$, $SD=0.33$) and was remarked as Strongly Agree. On the other hand, the handbook for equipment handling “*addresses the specific needs and challenges of its target audience effectively*” received the lowest mean score of responses with ($M=4.63$, $SD=0.49$) yet was also remarked Strongly Agree.

The level of features of a primer as a handbook for equipment handling of JHS students in terms of relevance attained a weighted mean score of 4.75 and a standard deviation of 0.25 and was Very High among the respondents.

Table 12. Status on the level of student’s performance in terms of Written Test

	<i>Mean</i>	<i>SD</i>	<i>MPS</i>	<i>N</i>	<i>HS</i>	<i>LS</i>	<i>Remarks</i>
Written Test	38.55	5.06	77.10%	40	46	25	Very Satisfactory/ High

Table 12 illustrates the level of the student’s performance in terms of written test during the 2nd Quarterly Examination.

From the table above, out of 40 students, the highest score obtained is 46 out of 50 questions while the lowest score is 25 out of 50 questions. Data obtained also, a weighted average among 40 students of ($M=38.55$) with a standard deviation of ($SD=5.06$) and was remarked as **Very Satisfactory or High**. The Mean Percentage Score (MPS) shows that 77.10% was obtained as the passing rate of the scores with the mastered competencies of: state different precautionary measures in the laboratory; identify the safety icons and symbols used inside a laboratory; classify different laboratory apparatus based on their uses; identify the different biological techniques use in biotechnology; describe these biological techniques, procedures and methods; explain the importance of aseptic technique; and and the least mastered of Appreciate the importance of these techniques to human life.

This part evaluates students' performance in Laboratory Tasks, including Vinegar and Baking Soda Volcano, Testing pH Levels of Household Substances, Investigating Rusting Rates, Paper Chromatography, and Mixture Separation, after utilizing a primer. These five (5) laboratories activities assess five (5) essential criteria: safety procedures, equipment handling, laboratory techniques, sample preparation, and equipment maintenance. To test and determine the mean level of Laboratory Tasks of eighth grader STE students, the researcher used the constructed rubrics with the use of five (5) rating scale for each criterion: 5 (excellent), 4 (proficient), 3 (competent), 2 (developing) and 1 (not yet competent) with a total of 25 points. These measures together assess how effectively students use primers as a tool for equipment handling to

improve their laboratory performance.

Table 13. Level of students' performance in laboratory task after using a primer.

Activity No. 1: Vinegar and Baking Soda Volcano			
Criteria	MEAN	SD	REMARKS
<i>Safety Procedures</i>	4.55	0.50	Excellent
<i>Equipment Handling</i>	4.53	0.64	Excellent
<i>Laboratory Techniques</i>	4.18	0.84	Excellent
<i>Sample Preparation</i>	4.40	0.74	Excellent
<i>Equipment Maintenance</i>	4.63	0.49	Excellent
<i>Weighted Mean</i>	4.46		
<i>SD</i>	0.64		
<i>Verbal Interpretation</i>	Advanced		

Table 13 provides a result of students' performance in Activity No. 1: Vinegar and Baking Soda Volcano after using a primer. From the data above, the students' performance criterion "*Laboratory Techniques*" yielded the lowest mean score ($M=4.18$, $SD=0.84$) and was remarked as Excellent. On the other hand, the students' performance criterion "*Equipment Maintenance*" received the highest mean score of responses with ($M=4.63$, $SD=0.49$) yet was also remarked Excellent.

The data shows that the performance of the of the students in this activity gained a weighted mean score of 4.46 and a standard deviation of 0.64 and marks a verbal interpretation of "Advanced". This indicates that most of the students were able to meet the expectations set by the performance criteria.

Table 14. Level of students' performance in laboratory task after using a primer.

Activity No. 2: Testing pH Levels of Household Substances			
Criteria	MEAN	SD	REMARKS
<i>Safety Procedures</i>	4.43	0.68	Excellent
<i>Equipment Handling</i>	4.53	0.68	Excellent
<i>Laboratory Techniques</i>	4.48	0.68	Excellent
<i>Sample Preparation</i>	4.75	0.44	Excellent
<i>Equipment Maintenance</i>	5.00	0.00	Excellent
<i>Weighted Mean</i>	4.64		
<i>SD</i>	0.50		
<i>Verbal Interpretation</i>	Advanced		

Table 14 provides a result of students' performance in Activity No. 2: Testing pH Levels of Household Substances after using a primer.

From the data above, the students' performance criterion "*Safety Procedures*" yielded the lowest mean score ($M=4.43$, $SD=0.68$) and was remarked as Excellent. On the other hand, the students' performance criterion "*Equipment Maintenance*" received the highest mean score of responses with ($M=5.00$, $SD=0.00$) yet was also remarked Excellent.

The data shows that the performance of the of the students in this activity gained a weighted mean score of 4.64 and a standard deviation of 0.50 and marks a verbal interpretation of "Advanced". This indicates that most of the students were able to meet the expectations set by the performance criteria.

Table 15. Level of students' performance in laboratory task after using a primer.

Activity No. 3: Investigating the Rate of Rusting			
Criteria	MEAN	SD	REMARKS
<i>Safety Procedures</i>	4.40	0.74	Excellent
<i>Equipment Handling</i>	4.55	0.68	Excellent
<i>Laboratory Techniques</i>	4.55	0.68	Excellent
<i>Sample Preparation</i>	4.70	0.56	Excellent
<i>Equipment Maintenance</i>	4.78	0.53	Excellent
<i>Weighted Mean</i>	4.60		
<i>SD</i>	0.64		
<i>Verbal Interpretation</i>	Advanced		

From the data above, the students' performance criterion "*Safety Procedures*" yielded the lowest mean score ($M=4.40$, $SD=0.74$) and was remarked as Excellent. On the other hand, the students' performance criterion "*Equipment Maintenance*" received the highest mean score of responses with ($M=4.78$, $SD=0.53$) yet was also remarked Excellent.

The data shows that the performance of the of the students in this activity gained a weighted mean score of 4.60 and a standard deviation of 0.64 and marks a verbal interpretation of "Advanced". This indicates that most of the students were able to meet the expectations set by the performance criteria.

Table 16. Level of students' performance in laboratory task after using a primer.

Activity No. 4: Paper Chromatography			
Criteria	MEAN	SD	REMARKS
<i>Safety Procedures</i>	4.95	0.22	Excellent
<i>Equipment Handling</i>	4.83	0.38	Excellent
<i>Laboratory Techniques</i>	4.85	0.43	Excellent
<i>Sample Preparation</i>	4.85	0.36	Excellent
<i>Equipment Maintenance</i>	5.00	0.00	Excellent
<i>Weighted Mean</i>	4.90		
<i>SD</i>	0.28		
<i>Verbal Interpretation</i>	Advanced		

Table 16 provides a result of students' performance in Activity No. 4: Paper Chromatography after using a primer.

From the data above, the students' performance criterion "*Equipment Handling*" yielded the lowest mean score ($M=4.83$, $SD=0.38$) and was remarked as Excellent. On the other hand, the students' performance criterion "*Equipment Maintenance*" received the highest mean score of responses with ($M=5.00$, $SD=0.00$) yet was also remarked Excellent.

The data shows that the performance of the of the students in this activity gained a weighted mean score of 4.90 and a standard deviation of 0.00 and marks a verbal interpretation of "Advanced". This indicates that most of the students were able to meet the expectations set by the performance criteria.

Table 17. Level of students' performance in laboratory task after using a primer.

Activity No. 5: Separation of Mixtures			
Criteria	MEAN	SD	REMARKS
<i>Safety Procedures</i>	4.93	0.27	Excellent

Equipment Handling	4.88	0.33	Excellent
Laboratory Techniques	4.85	0.36	Excellent
Sample Preparation	4.88	0.33	Excellent
Equipment Maintenance	5.00	0.00	Excellent
Weighted Mean	4.91		
SD	0.26		
Verbal Interpretation	Advanced		

Table 17 provides a result of students' performance in Activity No. 5: Separation of Mixtures after using a primer.

From the data above, the students' performance criterion "*Laboratory Techniques*" yielded the lowest mean score ($M=4.85$, $SD=0.36$) and was remarked as Excellent. On the other hand, the students' performance criterion "*Equipment Maintenance*" received the highest mean score of responses with ($M=5.00$, $SD=0.00$) yet was also remarked Excellent.

The data shows that the performance of the of the students in this activity gained a weighted mean score of 4.91 and a standard deviation of 0.26 and marks a verbal interpretation of "Advanced". This indicates that most of the students were able to meet the expectations set by the performance criteria.

Table 18 presents the test on effect between the level of component and features of a primer and students' written test.

The *objectives, equipment overview, safety guidelines, equipment handling, maintenance and cleaning and lastly emergency procedures* of the component of the handbook were observed to have a significant difference to the *cognitive ability* of the students. This is based on the computed paired t-test values obtained from the tests. Furthermore, the p-values obtained were less than the significance alpha 0.05, hence there is a significance.

Table 18. Test on effect between the level of component and features of a primer and students' written test.

Paired t-test								
	Paired Differences						df	Sig. (2-tailed)
	Mean	Std. Deviation	Std. Error Mean	95% Confidence Interval of the Difference				
				Lower	Upper			
Component								
Objectives	.37	.69	.11	.15	.59	3.37*	39	.002
Equipment overview	.45	.67	.12	.24	.66	4.24*	39	.000
Safety guidelines	.40	.71	.11	.17	.62	3.54*	39	.001
Equipment handling	.39	.73	.12	.15	.62	3.34*	39	.002
Maintenance and cleaning	.41	.65	.10	.20	.61	3.92*	39	.000
Emergency procedures	.41	.67	.11	.19	.62	3.84*	39	.000
Features								
Organization	.40	.65	.10	.19	.61	3.86*	39	.000
Design	.42	.68	.11	.20	.63	3.86*	39	.000
Clarity	.41	.68	.11	.19	.63	3.83*	39	.000
Visual presentation	.41	.68	.11	.19	.63	3.83*	39	.000

Relevance	.43	.67	.11	.21	.64	4.03*	39	.000
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Legend: *Significant at 0.05

Table 18 demonstrates the significant effect between the level of the component and features of a handbook and the students' written test.

The *organization, design, clarity, visual presentation and relevance* of the features of the handbook were observed to have a significant difference to the *cognitive ability* of the students. This is based on the computed paired t-test values obtained from the tests. Furthermore, the p-values obtained were less than the significance alpha 0.05, hence there is a significance.

From the findings above, we can infer that at 0.05 level of significance, the null hypothesis "There is no significant effect on the component and features of a primer for equipment handling and the students' written test" is rejected. Thus, the alternative should be accepted which incites that there is a significant correlation between them.

Table 19. Test on effect between the level of component and features of a primer and students' laboratory tasks.

	Paired Differences						df	Sig. (2-tailed)
	Mean	Std. Deviation	Std. Error Mean	95% Confidence Interval of the Difference				
				Lower	Upper			
Component	.025	.35	.02	-.02	.07	1.016	199	.311
Features	.036	.34	.02	-.01	.08	1.503	199	.135

Table 19 demonstrates the significant effect between the level of the component and features of a handbook and the students' laboratory tasks.

The *objectives, equipment overview, safety guidelines, equipment handling, maintenance and cleaning and lastly emergency procedures* of the component of the handbook were observed to have no significant difference to the *laboratory tasks* of the students. This is based on the computed paired t-test values obtained from the tests. Furthermore, the p-values obtained were greater than the significance alpha 0.05, hence there is a significance.

The *organization, design, clarity, visual presentation, and relevance* of the features of the handbook were observed to have no significant difference to the *laboratory tasks* of the students. This is based on the computed paired t-test values obtained from the tests. Furthermore, the p-values obtained were greater than the significance alpha 0.05, hence there is a significance.

From the findings above, we can infer that at 0.05 level of significance, the null hypothesis "There is no significant effect on the component and features of a primer for equipment handling and the students' laboratory tasks." is accepted.

4. Conclusion and Recommendation

Based on the findings of the study, the following conclusions were drawn:

The use of a primer was observed to have a significant effect. Thus, the use of a primer was observed to have a significant effect on students written test. Thus, the 1st hypothesis, is rejected. "There is a significant effect between the level of component and features of a primer and student's written test". The

implication drawn from this finding is that the use of a primer significantly affects students' performance in written tests. This conclusion rejects the hypothesis that there is no significant effect between the level of components and features of a primer and students' written test scores.

Meanwhile, the effect of a primer on students' laboratory tasks has no significant effect to the student's performance. Thus, the null hypothesis "There is no significant effect between the level of component and features of a primer and student's laboratory tasks" is accepted. This suggests that the level of components and features of the primer may not be optimally designed to improve students' performance in laboratory tasks. While the information in the primer is thorough and well-presented, it may not directly relate to the practical skills and knowledge needed for conducting laboratory tasks. Other factors, like individual learning styles, prior experience, or challenges during lab work, might have a greater influence on how well students perform. Further investigation is necessary to pinpoint areas where the primer can be enhanced to better assist students in their lab tasks. This could involve identifying specific gaps or adjustments needed in the primer to align more closely with the practical demands and learning preferences of students in laboratory settings.

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

1. The primer's component be improved to make sure it fully covers the objectives, an overview of the equipment, safety precautions, handling, maintenance, and cleaning methods, as well as emergency measures.
2. Maximize the primer handbook's efficacy as a tool for learning, pay attention to its features, with an emphasis on organization, design, clarity, visual presentation, and relevancy.
3. The teachers may provide real-world examples and to motivate more the students to use their cognitive abilities in laboratory settings. In order to help students, apply the knowledge and abilities they have learned from introductory handbooks, create collaborative learning environments.

References:

- Official Gazette (2012). Republic Act No. 10533, May 15, 2013; Implementing rules and regulations, September 4, 2013
- DepEd. (2016, June 7). Retrieved from Department of Education: <https://www.deped.gov.ph/2016/06/07/do-35-s-2016-the-learning-action-cell-as-a-k-to-12-basic-education-program-school-based-continuing-professional-development-strategy-for-the-improvement-of-teaching-and-learning/>