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Level of Knowledge on Science Laboratory Aspects and Laboratory Readiness Among Elementary Education Pre-service Teachers: Outline Basis for Laboratory Manual Development

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Abstract
Science teachers must possess robust laboratory skills to facilitate effective hands-on learning and inquiry-based instruction. This study assessed the level of laboratory knowledge and readiness among 64 elementary education pre-service teachers at President Ramon Magsaysay State University – San Marcelino to develop a foundational outline for a laboratory manual. Utilizing a quantitative descriptive-developmental design, data were collected from second to fourth-year respondents through instruments evaluating tool functions, safety protocols, and perceived readiness.
Results indicated that while knowledge of laboratory safety was "satisfactory" (M=16.40), proficiency in tool functions was only "slightly satisfactory" (M=11.56), with 38% of respondents failing to meet basic expectations. Participants generally perceived themselves as "ready" to manage activities and utilize equipment; however, statistical analysis showed no significant relationship between theoretical knowledge and practical readiness (p=.552). Academic year level was a significant factor in safety knowledge (p=.018), while gender showed no significant impact across all variables. The findings underscore a critical gap in technical competency, leading to the development of a laboratory manual outline designed to standardize and enhance the laboratory proficiency of future educators.

Keywords: Pre-service teachers, laboratory knowledge, laboratory readiness, science laboratory, manual development

Introduction

Background of the Study

Being knowledgeable to basic science concepts and principles are essential to everyone. And most of the times, teachers were expected to mold their understanding from their experiences. So it means, science teachers should possess a robust mastery of both content and pedagogical skills, as their proficiency in laboratory instruction directly informs the quality of scientific inquiry experienced by their students (Atud et al., 2025)[2].
However, science education in the Philippines often struggles with a "default curriculum" that prioritizes theoretical content over the practical application of scientific processes, hindering the development of inquiry-based instruction (Bahtaji, 2022)[3]. This challenge is compounded by the fact that many pre-service teachers enter training with limited academic exposure to science, often carrying negative past experiences that impede their pedagogical self-efficacy (García–Carmona et al., 2023)[6].
The Elementary teachers who specializes in generalist instruction often encounters a significant knowledge gap regarding laboratory management and technical experimentation, which limits their capacity to facilitate effective hands-on learning (Amatiaga & Dulay, 2026) [1]. This deficiency is further exacerbated by the residual effects of emergency remote teaching, which restricted opportunities for these educators to develop necessary practical work skills and conceptual depth (Khoza, 2024)[11].

Assessing the current laboratory competence of pre-service teachers is vital for identifying specific deficits in equipment handling and safety protocols that hinder the transition to effective inquiry-based instruction. Some systematic efforts are required to bridge these gaps through structured interventions, such as the implementation of specialized laboratory manuals that provide targeted guidance on tool functions and standardized safety procedures (Maglajos & Bapilar, 2026). That's studies like this were important.

This study aims to evaluate the level of knowledge and laboratory readiness among pre-service elementary teachers in a state university in Zambales, Philippines to serve as a foundational basis for the development of a localized laboratory manual.

Conceptual Framework

The researchers utilized the I-P-O model framework of the study. This framework shows the flow of data and materials into the process from the outside. Figure 1 presents the conceptual paradigm showing the relationship of the variables used in the study.

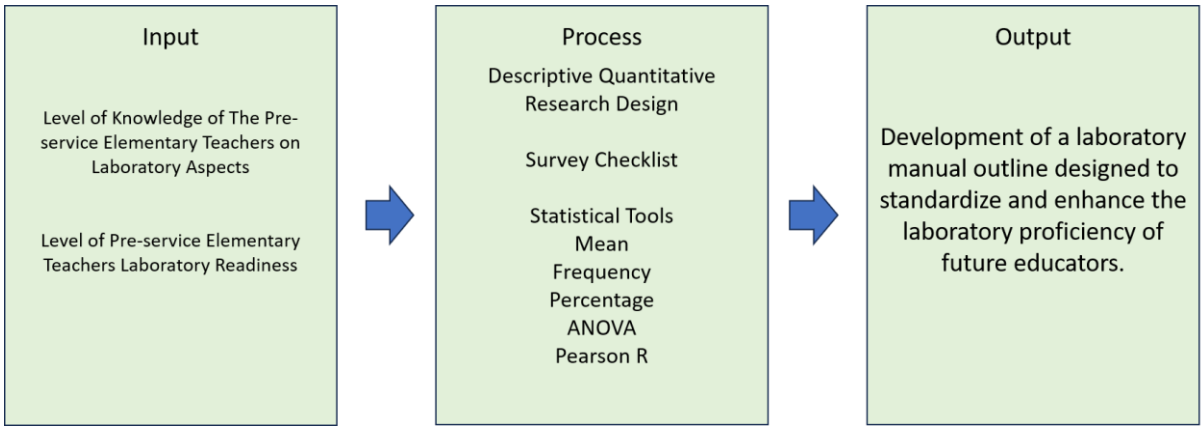

Fig 1: Conceptual Framework of the Level of Knowledge on Laboratory Aspects and Laboratory Readiness of Pre-Service Elementary Teachers

For the input or known as the cause variable/s dealt with the assessment of level of knowledge of the pre-service elementary teachers towards laboratory aspects and their laboratory readiness.

For the Process or also known as the method by which the variables are collected and synthesized dealt with data gathering, calculating the results, and statistical analysis.

For the output as the product that aims to develop outline as the basis for developing laboratory manual.

Statement of the Problem

This study aims to measure the level of knowledge on science laboratory aspects and level of laboratory readiness among elementary pre-service teachers of President Ramon Magsaysay State University – San Marcelino Campus. Specifically, the study aims to address the following questions:

1. How can be the respondents be described in terms of:
1.1 year level; and
1.2 sex?
2. What is the level of knowledge of the pre-service elementary teachers on laboratory aspects in terms of:
2.1 functions of laboratory tools; and
2.2 laboratory safety?
3. How may the pre-service elementary teachers laboratory readiness be described in terms of:
3.1 laboratory activities or experiments;
3.2 utilization of laboratory tools; and
3.3 laboratory accidents?
4. Is there a significant difference in the level of knowledge of pre-service elementary teachers in laboratory aspects when grouped according to profile variables?
5. Is there a significant difference in the laboratory readiness of pre-service elementary teachers when grouped according to profile variables?
6. Is there a significant relationship between level of knowledge and laboratory readiness of Pre-Service Elementary Teachers?

The study employed a descriptive quantitative research design, utilizing the Input-Process-Output model to systematically evaluate laboratory competencies among pre-service teachers. The research was conducted at President Ramon Magsaysay State University – San Marcelino Campus, focusing on students enrolled in the Bachelor of Elementary Education program. A sample of 64 respondents, spanning the second to fourth-year levels, was selected through simple random sampling. This methodological framework was designed to assess the current level of knowledge and readiness of future educators as a foundational step toward developing a comprehensive laboratory manual outline.

Data collection was facilitated through a multi-part research instrument that included a demographic profile, a 44-item true-or-false knowledge assessment, and a 15-item Likert-scale readiness checklist. The knowledge assessment specifically targeted the functions of laboratory tools (20 items) and safety precautions (24 items), while the checklist measured readiness in managing activities, utilizing equipment, and addressing accidents. To ensure the instrument's validity and reliability, it was reviewed by three science education experts and pilot-tested with 15 science majors. The gathered data were analyzed using frequency and percentage distribution, weighted mean, and a 4-point Likert scale. Additionally, Analysis of Variance was used to test for significant differences across demographic groups, and Pearson Correlation Analysis was employed to examine the

relationship between the participants' theoretical knowledge and their practical laboratory readiness.

Results and Discussion

This chapter explains the results and discussion of this study. It presents the gathered data regarding the level of knowledge on science laboratory aspects and laboratory readiness among Elementary Pre-Service Teachers in President Ramon Magsaysay State University-San Marcelino Campus.

Profile of the Respondents

The profile of the Elementary Pre-Service Teachers provides clearer background of their year level and sex.

Table 4 presents the frequency and percentage distribution of the profile of the Elementary Pre-Service Teachers.

Table 1: Frequency and Percent Distribution of the Profile of the Elementary Pre-Service Teachers

Profile of the Respondents		Frequency	Percentage
Year Level	2nd	18	28
	3rd	22	34
	4th	24	38
Sex	Male	24	38
	Female	40	62

Year Level. As shown in Table 4, 28% of respondents belong to 2nd year level, 34% belongs to 3rd year level, and 38% belongs to 4th year level. It can be clearly seen that majority of the respondents were 4th year-Elementary Pre-Service Teachers.

Sex. In terms of sex, there were 24 (38%) males while the remaining 40 (62%) are females. Majority of the respondents of this study were females.

Level of Knowledge on Science Laboratory Aspects of Elementary Pre-Service Teachers

To determine the Elementary Pre-Service Teachers' level of knowledge on laboratory aspects, they will answer true-or-false questions to test about their background knowledge in terms of functions of laboratory tools and equipment and laboratory safety precautions.

Uses of Laboratory Tools and Equipment

The Table 5 shows the average score of the Elementary Pre-Service Teachers in laboratory aspects in terms of functions of laboratory tools is 11.56 which fall under the slightly satisfactory category. T

Table 2: Level of Knowledge Among Elementary Pre-Service Teachers in Laboratory Aspects in terms of Functions of Laboratory Tools

Scores	Frequency	Percentage	Verbal Description
1 – 10	24	38	Did Not Meet Expectation
11-13	26	40	Slightly Satisfactory
14-16	12	19	Satisfactory
17-18	2	3	Very Satisfactory
Total	64	100	
Mean Score	11.56	Mean SD = 2.40	Slightly Satisfactory

The table showed that a plurality of respondents, comprising 40% of the sample, performed within the slightly satisfactory range, indicating a need for targeted instructional intervention to bridge gaps in practical equipment proficiency. Additionally, 38% of the respondents did not meet expectations, highlighting a significant gap in foundational technical knowledge that matches concerns about the adequacy of science process skills in undergraduate students. This ongoing lack of basic laboratory knowledge suggests that current teaching methods may not be enough to help future teachers develop the necessary technical skills (Kamaludin & Yustiana, 2024) [10]. Furthermore, the findings parallel previous observations that emphasize the critical role of structured teacher preparation programs in bridging the disparity between theoretical coursework and practical laboratory management competencies (Fagihi, 2018)[5].

Laboratory Precautions

Table 6 shows the result of the level of knowledge in laboratory aspects in terms of laboratory safety of Elementary Pre-Service Teachers.

Table 3: Level of Knowledge Among Elementary Pre-Service Teachers in Laboratory Aspects in terms of Laboratory Safety

Scores	Frequency	Percentage	Verbal Description
1 – 12	8	13	Did Not Meet Expectation
13-15	12	19	Slightly Satisfactory
16-18	30	46	Satisfactory
19-21	14	22	Very Satisfactory
Total	64	100	
Mean Score	16.40	Mean SD = 2.69	Satisfactory

The highest percentage of respondents reached a satisfactory level, with 46% of the participants demonstrating a functional understanding of essential safety protocols in a science laboratory setting.

The mean score is 16.40, which falls under the satisfactory category. This suggests that the Elementary Pre-Service Teachers has general understanding of laboratory safety precautions for they scored average. However, despite this

proficiency in identifying safety measures, further analysis indicates that many pre-service teachers continue to struggle with providing accurate justifications for these protocols (Bilen, 2025)[4]. This discrepancy between identifying safety procedures and conceptualizing their necessity echoes findings that, while candidates may recognize the importance of laboratory security, they often lack the deep technical knowledge required to apply these protocols effectively (KIRBAŞLAR et al., 2010)[12]. Similarly, research indicates that while teacher candidates generally acknowledge the necessity of safety regulations, they frequently display significant gaps when tasked with interpreting specific warning symbols or articulating nuanced safety procedures (Kaçar et al., 2021) [9].

Level of Readiness Among Elementary Pre-Service Teachers

To determine the Elementary Pre-Service Teacher's readiness, they will answer 3 different levels; each level has 5 statements about laboratory. In this study, it determines laboratory readiness towards managing laboratory activities or experiments; utilizing laboratory tools; and addressing laboratory accidents.

Management of Laboratory Activities or Experiments

This table presents the mean scores and standard deviations reflecting how ready the participants felt to manage science laboratory activities and experiments.

Table 4: Level of Readiness Among Elementary Pre-Service Teachers in terms of Management of Laboratory Activities or Experiments

	Mean	SD	VD	Rank
1. You are ready to manage the laboratory where science activities take place.	3.09	0.73	R	3
2. You are ready to implement laboratory rules.	3.19	0.74	R	2
3. You are ready to evaluate the findings of experiment and to write laboratory report.	2.88	0.61	R	5
4. You are confident to conduct basic experiments.	3.25	0.80	R	1
5. You are ready to present laboratory results clearly.	2.94	0.62	R	4
Overall Mean	3.07	0.70	R	

This table shows that the respondents perceive themselves as "Ready" across all indicators, with an overall mean score of 3.07, suggesting a moderate level of confidence in managing fundamental laboratory procedures. The respondents were ready because they confident in conducting basic experiments, evident from the highest mean of 3.25. Moreover, they are also ready they are willing to implement laboratory rules (m=3.19), manage to science activities to take place (m=3.09), and present laboratory results while maintaining clear documentation of their experimental findings evident from the lowest mean of 2. 94 and 2.88, respectively.

It is good if the pre-service teachers were ready with managing the laboratory. However, despite this perceived readiness, studies indicate that pre-service teachers often lack sufficient confidence and technical understanding when selecting appropriate hand tools for specific tasks, such as deconstructing items or performing complex tinkering challenges (Love, 2023)[15]. Furthermore, even when pre-service teachers report a sense of readiness, their actual mastery of science process skills often remains only in the sufficient category, suggesting that confidence may not always equate to practical competence (Wola et al., 2023)[26].

Utilization of Laboratory Tools

The Table 8 presents the level of readiness of Elementary Pre-Service Teachers in terms of utilization of laboratory tools.

Table 5: Level of Readiness Among Elementary Pre-Service Teachers in terms of Utilization of Laboratory Tools

	Mean	SD	VD	Rank
1. You are ready to select appropriate tools for a given experiment.	3.00	0.72	R	4
2. You are ready to develop and use simple tools for laboratory studies.	3.13	0.61	R	2
3. You are ready to use laboratory tools and equipment in a good manner.	3.19	0.64	R	1
4. You are ready to use basic laboratory tools like Erlenmeyer flask and test tubes.	2.97	0.90	R	5
5. You are ready to arrange laboratory tools according to their use.	3.09	0.73	R	3
Overall Mean	3.08	0.72	R	

The table presents the participants' perceived proficiency in equipment handling, revealing an overall mean score of 3.08 that reflects a consistent ability to organize and utilize fundamental apparatus within a controlled environment. The respondents were ready to use laboratory tools and equipment in good manner evident from the highest mean 3.19. Moreover, they are ready to develop and use simple apparatus for various laboratory activities (3.13), arrange laboratory tools according to their specific functions (m=3.09), and utilize common glassware like test tubes or flasks (m=2.97), maintaining a functional readiness level that is consistent with the expectations for pre-service science instruction (Parmin & Khusniati, 2021)[20]. These findings align with existing research suggesting that hands-on engagement with equipment is essential for developing the independence necessary for effective laboratory management (Kızkapan et al., 2023)[13].

Addressing Laboratory Accidents

Table 9 shows the level of readiness among Elementary Pre-Service Teachers towards addressing laboratory accidents.

Table 6: Level of Readiness Among Elementary Pre-Service Teachers in terms of Addressing Laboratory Accidents

	Mean	SD	VD	Rank
1. You are ready to handle failed experimental process.	2.66	0.70	R	5
2. You are ready to use fire extinguisher for emergency purposes.	3.19	0.78	R	4
3. You are ready to follow rules when using laboratory equipment.	3.44	0.67	SR	1
are ready to make an effort to solve problems encountered during the laboratory process.	3.25	0.76	R	3
. You are completely prepared for laboratory accidents such as using first aid kits.	3.28	0.77	SR	2
Overall Mean	3.16	0.74	R	

The table revealed that the respondents maintain a "Ready" status across all safety-related indicators evident from the overall mean of 3.16. The respondets were ready to follow rules and protocols for equipment usage, securing the highest rank with a mean of 3.44. Moreover, they also demonstrated a strong commitment to emergency preparedness, particularly regarding the application of first-aid procedures (m=3.28), solve problems encountered during laboratory process (m=3.25), and the operation of fire extinguishers (m=3.19).

The readiness of the pre-service teachers were characterized by a focus on adherence to safety protocols which is essential for fostering a secure environment that mitigates common risks during scientific experimentation (Rivera & Deleon, 2026)[21]. However, it is critical to recognize that procedural adherence alone does not guarantee the high-level proficiency needed to navigate unforeseen complications in complex inquiry-based tasks (Imaduddin & Hidayah, 2019) [7].

Significant Difference in the Level of Knowledge of Laboratory Aspects as to Profile

Laboratory Tools and Equipment

Table 10 shows the significant difference on the level of knowledge towards laboratory aspects in terms of laboratory tools and equipment among Elementary Pre-Service Teachers when grouped according to year level and sex.

Table 7: Significant Difference on the Level of Knowledge of Laboratory Tools and Equipment among Elementary Pre-Service Teachers when Grouped According to Profile Variables

Profile		Sum of Squares	df	Mean Square	F	Sig.	Decision
Year Level	Between Groups	12.898	2	6.449	1.134	.336	Accepted Not Significant
	Within Groups	164.977	29	5.689			
	Total	177.875	31				
Sex	Between Groups	1.875	1	1.875	.320	.576	Accepted Not Significant
	Within Groups	176.000	30	5.867			
	Total	177.875	31				

The table revealed that no significant differences exist in the knowledge levels of laboratory tools and equipment across both year levels (p =.336) and sex (p =.576), indicating that these demographic factors do not fundamentally influence participants' reported proficiency in equipment handling. This lack of statistical variance suggests that curricular exposure to laboratory fundamentals may be uniformly distributed across the program, rather than varying by gender or academic progression (Sumile & Malinao, 2025)[24]. This consistency in knowledge suggests that foundational training is internalized independently of students' personal backgrounds or their stage in the academic program (Oktariani et al., 2022)[19].

Laboratory Safety Precautions

Table 11 presents the results regarding the significant differences in participants' knowledge of safety protocols when categorized by demographic variables such as year level and sex.

Table 8: Significant Difference on the Level of Knowledge of Laboratory Safety Precautions among Elementary Pre-Service Teachers when Grouped According to Profile Variables

Profile		Sum of Squares	df	Mean Square	F	Sig.	Decision
Year Level	Between Groups	54.943	2	27.472	4.665	.018	Rejected Significant
	Within Groups	170.775	29	5.889			
	Total	225.719	31				
Sex	Between Groups	13.002	1	13.002	1.834	.186	Accepted Not Significant
	Within Groups	212.717	30	7.091			
	Total	225.719	31				

The table revealed that a significant difference in safety protocol knowledge exists when grouped by year level (p =.018), suggesting that academic progression plays a measurable role in the acquisition of complex safety competencies. This finding aligns with other studies showing that more advanced students demonstrate higher levels of process skills compared to their juniors due to sustained engagement with experimental environments (Irwanto et al., 2018) [8].

Though, gender did not emerge as a statistically significant factor (p =.186) in these safety knowledge assessments, a result consistent with findings that emphasize uniform instructional conditions over learner demographics in skill mastery (Sebastian, 2025)[23]. These results indicate that while cumulative experience within the curriculum effectively shapes specific safety expertise, general demographic traits such as gender do not inherently dictate

performance outcomes in experimental settings (Mumba et al., 2018)[18].

Significant Difference in the Level of Preparedness for Laboratory Management as to Profile

Management of Laboratory Activities or Experiments

Table 12 shows the significant difference in the level of preparedness for the management of laboratory activities among Elementary Pre-Service Teachers when grouped according to their year level and sex.

Table 9: Significant Difference in the Level of Readiness in Managing Laboratory Activities and Experiments among Elementary Pre-Service Teachers when Grouped According to Profile Variables

Profile		Sum of Squares	df	Mean Square	F	Sig.	Decision
Year Level	Between Groups	.477	2	.238	.747	.483	Accepted Not significant
	Within Groups	9.252	29	.319			
	Total	9.729	31				
Sex	Between Groups	.140	1	.140	.438	.513	Accepted Not significant
	Within Groups	9.589	30	.320			
	Total	9.729	31				

This table reveals that the preparedness of pre-service teachers to facilitate laboratory activities remains consistent across both year levels (p =.483) and sex (p =.513), indicating that confidence in pedagogical management may be independent of formal academic advancement or demographic background. This finding suggests that pedagogical preparedness may instead be influenced by individual training exposure rather than structural curriculum cycles (Said et al., 2019)[22]. Consequently, targeted instructional interventions that provide hands-on experience may be more effective in enhancing self-efficacy than reliance on time-based progression alone (Love et al., 2022)[16]. This observation aligns with empirical research indicating that while learning environments and specific instructional strategies significantly impact pre-service teachers' self-efficacy, these outcomes often transcend gender and year-level categorization.

Utilization of Laboratory Tools

Table 13 shows the significant difference in the levels of proficiency regarding the application of laboratory apparatus among pre-service teachers when categorized by their demographic profiles.

Table 10: Significant Difference in the Utilization of Laboratory Tools among Elementary Pre-Service Teachers when Grouped According to Profile Variables

Profile		Sum of Squares	df	Mean Square	F	Sig.	Decision
Year Level	Between Groups	.589	2	.294	.691	.509	Accepted Not significant
	Within Groups	12.351	29	.426			
	Total	12.940	31				
Sex	Between Groups	.033	1	.033	.077	.783	Accepted Not significant
	Within Groups	12.907	30	.430			
	Total	12.940	31				

The table indicates that there are no statistically significant differences in the utilization of laboratory tools based on year level (p =.509) or sex (p =.783), suggesting that operational proficiency with apparatus is evenly distributed among the cohort. This lack of difference shows that the curriculum provides everyone with equal access to technical training, which helps balance out any differences in students' past laboratory experience (Kolil et al., 2023)[14]. This consistent level of skill across the board shows that standardized teaching methods are effective at helping all students learn in the same way.

Addressing Laboratory Accidents

Table 14 shows the results of the study on the level of readiness of Elementary Pre-Service Teachers in terms of Addressing Laboratory Accidents when grouped according to year level and sex.

Table 11: Significant Difference in the Level of Preparedness for Addressing Laboratory Accidents among Elementary Pre-Service Teachers when Grouped According to Profile Variables

Profile		Sum of Squares	df	Mean Square	F	Sig.	Decision
Year Level	Between Groups	.554	2	.277	.690	.509	Accepted Not Significant
	Within Groups	11.641	29	.401			
	Total	12.195	31				
Sex	Between Groups	.120	1	.120	.299	.589	Accepted Not Significant
	Within Groups	12.075	30	.402			
	Total	12.195	31				

This table revealed that no statistically significant differences exist in the readiness of pre-service teachers to manage laboratory accidents across the evaluated demographic profiles year level (p =.509) and sex (p=.589), reflecting a uniform standard of crisis management training throughout the program. These findings confirm that technical skill mastery and safety preparedness are not tied to gender or academic year, suggesting the curriculum ensures consistent performance across all student teachers (Wahyudiati et al., 2019)[25]. This uniformity indicates that with standardized teaching, demographic factors—often believed to influence self-confidence—do not significantly affect performance in practical training (Muega-Geronimo & Carlos, 2023)[17].

Relationship between the Level of Laboratory Knowledge and Laboratory Readiness Among Elementary Pre-Service Teachers

The relationship between the level of laboratory knowledge and laboratory readiness among Elementary Pre-Service Teachers is presented on Table 15. This study presents a no statistically significant relationship between laboratory readiness and laboratory knowledge.

Table 12: Significant Relationship Between the Level of Laboratory Knowledge and Readiness among Elementary Pre-service Teachers

Variable Pair	Pearson Correlation	Sig. (2-tailed)	N
Readiness ↔ Readiness	1.000	—	32
Readiness ↔ Knowledge	-0.109	0.552	32
Knowledge ↔ Readiness	-0.109	0.552	32
Knowledge ↔ Knowledge	1.000	—	32

The table revealed that there is a weakly negative correlation between laboratory readiness and knowledge among elementary pre-service teachers, with a Pearson correlation coefficient of -.109. This suggests a slight tendency for teachers with lower readiness scores to have higher knowledge scores, and vice versa. However, the correlation is very weak, with a significance level of.552 which is greater than (>) 0.05Alpha level of significance; therefore the null hypothesis is accepted. This indicating that the results are not statistically significant, making it difficult to confirm a true negative correlation in the sample population.

This clearly indicates that there is no relevance between having insufficient and adequate knowledge on functions of laboratory tools and laboratory safety precautions towards being ready and not ready to manage laboratory activities, utilize laboratory tools, and address laboratory accidents.

The output of this study is the outline basis for laboratory manual listed on Appendix B. This laboratory manual is composed of three parts: Parts of Manual; List of Chapters; and Parts of Chapters. The first part includes title page, introduction, table of contents and chapter. The second part includes the number of chapters and their titles which composed of apparatus, safety precautions, dos and don'ts inside the laboratory and proper disposal of metals, non-metals, corrosives, mixing acid, and water. The last part includes the parts of objective, content, diagram/figures, and references. This output will serve as a basis for the development of laboratory manual.

Conclusions

1. Most of the respondents are 4th year female elementary education students.
2. The average score for Elementary Pre-Service Teachers in laboratory tools and equipment usage is slightly satisfactory, with 38% not meeting expectations. However, 46% have satisfactory knowledge of laboratory safety, with 22% scoring very satisfactory.
3. The respondents were ready in managing laboratory activities or experiments, utilizing laboratory tools, and addressing laboratory accidents.
4. Based from the results it found no significant difference in knowledge levels of laboratory tools and equipment usage based on year level and sex variables, indicating the null hypothesis. However, there was a significant difference in knowledge on laboratory safety precautions based on year level variables.
5. The study found no significant difference in readiness for laboratory activities management, tool utilization, or addressing accidents based on year level and sex variables, indicating the null hypothesis.
6. The study found a weakly negative correlation between laboratory knowledge and readiness of Elementary Pre-Service Teachers, indicating a low likelihood of higher knowledge and readiness.

Recommendations

Based on the findings of this study, the following recommendations are proposed to address the problems and may provide solutions:

1. To the Department of College of Teacher Education to focus Teaching Science on laboratory activities and practices for familiarization.
2. To enhance the laboratory activities and experiments by utilizing laboratory tools.
3. To incorporate laboratory safety precautions on demonstration teaching in Teaching Science in the Primary and Intermediate Grades.
4. To the next researchers to include High School experimentations experiences of Elementary Pre-Service Teachers whether they graduated from public or private school as their variable.
5. To enrich the knowledge of Elementary Pre-Service Teachers in laboratory uses of tools and equipment.
6. To conduct a training workshops to Pre-service Elementary teachers about laboratory activities
7. Conduct an in-depth and related studies about laboratory aspects and readiness.

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