

## Effects of Accessibility to Science Laboratories on the Academic Performance of Grade Five Pupils in Public Elementary Schools

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### Abstract

This study examined the effects of accessibility to science laboratories on the academic performance of Grade Five pupils in selected public elementary schools in the Division of Pasig City during the School Year 2024–2025. Specifically, it sought to determine how access to science laboratories influences pupils' scientific and critical thinking, problem-solving skills, and engagement in inquiry-based learning, as well as to examine whether selected demographic variables affect these perceptions. The respondents of the study were 284 Grade Five pupils from Maybunga Elementary School, Rosario Elementary School, and San Miguel Elementary School, selected through simple random sampling using Slovin's formula. A descriptive survey research design complemented by documentary analysis was utilized. Data were gathered using a researcher-made questionnaire-checklist, while pupils' academic performance in Science was obtained through their average grades. The findings revealed that the respondents were predominantly female, mostly third-born children, and came from low-income families, with parents who were mostly college graduates and employed. The results further showed that accessibility to science laboratories had a very high extent of effect on pupils' development of problem-solving skills, scientific and critical thinking, and inquiry-based learning. However, demographic variables such as sex, sibling position, family size, monthly income, and parents' educational attainment and occupation did not significantly influence pupils' perceptions. The study also found that the pupils' academic performance in Science was satisfactory and that there was a significant correlation between laboratory accessibility and academic performance. The study concludes that access to science laboratories plays a vital role in enhancing pupils' academic outcomes regardless of their demographic background. It recommends that school administrators prioritize the establishment and improvement of accessible, well-equipped science laboratories, while teachers should integrate laboratory-based and inquiry-driven activities in their instruction. Further research on related variables is also encouraged.

**Keywords:** Accessibility, Science Laboratories, Academic Performance, Grade Five Pupils, Inquiry-Based Learning, Problem-Solving Skills, Critical Thinking, Elementary Education, Educational Facilities, Science Education

### Introduction

Education is widely recognized as a fundamental pillar in individual and societal development. It plays a crucial role in shaping knowledge, skills, and values that prepare learners to become productive and responsible citizens. In the Philippine context, the 1987 Constitution, Article XIV, Section 1, emphasizes the State's commitment to promote and ensure access to quality education for all citizens. This underscores the responsibility of educational institutions to provide meaningful and effective learning experiences that contribute to national development. In line with this, science education is particularly significant as it equips learners with scientific literacy, critical thinking, and problem-solving skills necessary in a rapidly advancing technological world.

According to Department of Education Philippines (2024) under the MATATAG Curriculum policy, the country remains committed to aligning its education system with global standards, ensuring inclusive, equitable, and quality education for all learners. Science education, therefore, must go beyond theoretical instruction and emphasize experiential learning through laboratory-based activities. The use of science laboratories allows learners to engage in hands-on experiences, enabling them to connect abstract concepts with real-world applications.

Related studies highlight the importance of science laboratories in enhancing students' academic performance and learning outcomes. Foreign studies such as those by Eyenaka (2021), Abidoye (2022), and Olagundoye (2021) reveal that access to well-equipped laboratories significantly improves students' engagement, motivation, and understanding of scientific concepts. Similarly, Alex (2021) found a strong positive correlation between the use of laboratory facilities and academic performance in science, while Ofeimu (2022) emphasized that the availability and utilization of laboratory equipment are significant predictors of student learning outcomes. However, these studies primarily focused on secondary or higher-level learners and often involved teachers or senior students as respondents, leaving a gap in understanding at the elementary level.

Local studies also support these findings. Caballes (2022) and Abas (2020) revealed that many schools in the Philippines lack adequate laboratory facilities, which negatively affects the implementation of science curricula. Noroña (2021), Villaran (2023), and Cagaanan (2021) further emphasized that limited access to laboratory resources restricts the development of scientific skills and reduces learners' interest and engagement in science. Moreover, Juanico (2022) highlighted the challenges faced by teachers due to insufficient laboratory materials, affecting the delivery of effective science instruction.

Despite the abundance of related literature and studies, several research gaps remain. First, most studies were conducted at the secondary or tertiary level, with limited focus on Grade Five pupils, who are at a critical stage in developing foundational scientific skills. Second, existing studies often concentrated on laboratory availability and utilization, but fewer studies specifically examined accessibility and its direct relationship with pupils' academic performance. Third, many studies involved teachers as respondents, whereas there is a need to capture the perceptions of pupils themselves regarding laboratory accessibility and its impact on their learning. Lastly, there is a lack of localized studies within the Division of Pasig City that directly examine the correlation between science laboratory accessibility and academic performance at the elementary level.

In response to these gaps, this study was conducted to determine the effects of accessibility to science laboratories on the academic performance of Grade Five pupils in selected public elementary schools in the Division of Pasig City.

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## **Material and methods**

### **2.1 Research Design**

The study applied the descriptive research method, employing a researcher-made questionnaire checklist to collect the necessary data.

### **2.2 Locale of the Study**

The study was conducted in selected public elementary schools in the Division of Pasig City. These schools include Maybunga Elementary School, Rosario Elementary School and San Miguel Elementary School. These schools are public institutions under the Department of Education (DepEd) which offer complete elementary education from kindergarten to grade six level.

### **2.3 Respondents of the Study**

The respondents of the study consisted of 284 Grade Five pupils from selected public elementary schools in the Division of Pasig City, namely Maybunga Elementary School, Rosario Elementary School, and San Miguel Elementary School. These respondents were chosen to represent the target population of 843 Grade Five pupils across the three schools. The participants were described in terms of their demographic profile, including sex, sibling position, number of children in the family, monthly family income, parents' educational attainment, and parents' occupation. The distribution of respondents per school included 53 pupils from Maybunga Elementary School, 69 pupils from Rosario Elementary School, and 162 pupils from San Miguel Elementary School.

### **2.4 Sample and Sampling Procedure**

The sample size of 284 respondents was determined using Slovin's formula to ensure an adequate and representative sample from the total population. Simple random sampling technique was utilized to select the respondents, giving each Grade Five pupil an equal chance of being included in the study. This method was used to minimize bias and ensure that the sample accurately reflects the characteristics of the entire population of Grade Five pupils in the selected schools. Through this process, the researcher was able to gather reliable and generalizable data regarding the accessibility of science laboratories and its effects on pupils' academic performance.

### **2.5 Research Instrument**

A researcher-made questionnaire-checklist served as the primary instrument in gathering the necessary data for the study. The instrument consisted of three parts: Part I focused on the respondents' personal profile, including sex, sibling position, number of children in the family, monthly family income, parents' educational attainment, and parents' occupation; Part II assessed the extent of the effects of accessibility to science laboratories on Grade Five pupils' academic performance in terms of scientific and critical thinking, problem-solving skills, and inquiry-based learning, with each domain containing 10 items for a total of 30 items; and Part III examined the extent of problems encountered in the utilization of science laboratories in public elementary schools. A five-point Likert scale was used to interpret responses, with corresponding verbal interpretations ranging from "Very High Extent" to "Least Extent" for Part II, and from "Always" to "Never" for Part III. In addition, the pupils' average grades in Science were used as the basis for determining their level of academic performance, interpreted using a descriptive scale ranging from "Outstanding" to "Did Not Meet Expectations." To ensure

the validity of the instrument, it underwent content validation through the review of experts, including the thesis adviser, principal, subject coordinator, statistician, professorial lecturers, and the Dean of the Graduate Studies Program, whose feedback and recommendations were incorporated in refining the final version of the questionnaire.

## 2.6 Data Gathering Procedure

The researcher followed the Gantt Chart of Activities in the conduct of the study. This includes the formulation of the research problem up to the revision of the manuscript and submission of the final copy. Permission to conduct the study were obtained from the Office of the Schools Division Superintendent. After the validation of the instrument, the questionnaire-checklist was administered to the respondents through the Google Survey form in compliance with the Data Privacy Act of 2012. After the retrieval, the data were encoded and processed utilizing the Statistical Package for Social Sciences. Based on the interpreted data, summary of findings, conclusions and recommendations were formulated. After the oral defense, the manuscript was revised incorporating all the comments and suggestions of the oral examination committee. The study was also subjected to anti plagiarism test. After the final revision of the manuscript, hard bound copies were submitted to the office of the graduate studies program and other concerned offices.

## 2.7 Data Analysis Techniques

The data gathered in this study were analyzed and interpreted using appropriate statistical tools based on the specific objectives of the study. To describe the profile of the respondents in terms of selected variables, frequency count, percentage, and rank distribution were used. The weighted mean was employed to determine the extent of the effects of accessibility to science laboratories on the academic performance of Grade Five pupils in terms of scientific and critical thinking, problem-solving skills, and inquiry-based learning, as well as to assess the extent of problems encountered in the utilization of science laboratories. To determine the level of academic performance in Science based on the pupils' average grades, frequency, mean, and standard deviation were applied. One-way Analysis of Variance (ANOVA) was used to test for significant differences in the perceived extent of effects of accessibility to science laboratories on academic performance when respondents were grouped according to their profile variables. Furthermore, correlation analysis was utilized to determine the significant relationship between the perceived extent of effects of accessibility to science laboratories and the pupils' level of academic performance. These statistical tools were used to ensure a comprehensive and reliable analysis of the data gathered in the study.

## 2.8 Ethical Considerations

This study strictly adhered to ethical standards in the conduct of research. Prior to data collection, permission was sought from the school authorities and concerned officials to ensure proper coordination and approval. The respondents were informed about the purpose of the study, and their participation was entirely voluntary. Informed consent was obtained, assuring them that they could withdraw from the study at any time without any consequences. Confidentiality and anonymity of the respondents were strictly maintained by not disclosing their identities and ensuring that all collected data were used solely for academic purposes. Additionally, the researcher ensured that no harm, discomfort, or bias would affect the participants throughout the process. All information gathered was treated with utmost respect and integrity, and results were presented honestly and objectively.

## Results and Discussion

### 3.1 Profile of the Two Groups of Respondents in Terms of the Selected Variables

It can be seen from the table that in terms of sex, out of 284 pupil-respondents, there are 161 or 56.7 percent females and 123 or 43.3 percent males. In terms of sibling position, there are 118 or 41.5 percent who are third-born child; followed by 96 or 33.8 percent who are fourth and about born child; while only 23 or 8.1 percent who are first-born child in the family. As regard to number of children in the family, there are 134 or 47.2 who have 3 siblings; 86 or 30.3 percent who have 2 children; while 18 or 6.3 percent who have 4 and above children. In terms of monthly family income, most of them have monthly income of Php 10,000.00 – Php 14,999.00 with 147 or 51.8 percent, followed by Php 15,000.00 – Php 19,999.00 with 86 or 30.3 percent; while 23 or 8.1 percent who have monthly earnings of Php 20,000.00 and above. Most of their parents' are college graduates and high school graduates who are mostly employed, entrepreneurs and househusband/housewife and few of them are self-employed.

Table 1.1  
*Frequency and Percentage Distribution of the Respondents  
in Terms of Selected Variables*

| Sex              | F          | %            | Rank |
|------------------|------------|--------------|------|
| Male             | 123        | 43.3         | 2    |
| Female           | 161        | 56.7         | 1    |
|                  | <b>284</b> | <b>100.0</b> |      |
| Sibling Position | F          | %            | Rank |
| First            | 23         | 8.1          | 4    |

|                                         |               |              |             |
|-----------------------------------------|---------------|--------------|-------------|
| Second                                  | 47            | 16.5         | 3           |
| Third                                   | 118           | 41.5         | 1           |
| Fourth and above                        | 96            | 33.8         | 2           |
| <b>Total</b>                            | <b>284</b>    | <b>100.0</b> |             |
| <b>Number of Children in the Family</b> | <b>F</b>      | <b>%</b>     | <b>Rank</b> |
| 4 and above                             | 18            | 6.3          | 4           |
| 3                                       | 134           | 47.2         | 1           |
| 2                                       | 86            | 30.3         | 2           |
| 1                                       | 46            | 16.2         | 3           |
| <b>Total</b>                            | <b>284</b>    | <b>100.0</b> |             |
| <b>Monthly Family Income</b>            | <b>F</b>      | <b>%</b>     | <b>Rank</b> |
| ₱20,000 and above                       | 23            | 8.1          | 4           |
| ₱15,000 –₱19,999                        | 86            | 30.3         | 2           |
| ₱10,000 –₱14,999                        | 147           | 51.8         | 1           |
| Below ₱10,000                           | 28            | 9.8          | 3           |
| <b>Total</b>                            | <b>284</b>    | <b>100.0</b> |             |
| <b>Parent's Educational Attainment</b>  | <b>Father</b> |              |             |
|                                         | <b>f</b>      | <b>%</b>     | <b>Rank</b> |
| College Graduate                        | 138           | 48.6         | 1           |
| College Undergraduate                   | 114           | 40.1         | 2           |
| High School Graduate                    | 32            | 11.3         | 3           |
| <b>Total</b>                            | <b>284</b>    | <b>100.0</b> |             |
| <b>Parent's Occupation</b>              | <b>Father</b> |              |             |
|                                         | <b>f</b>      | <b>%</b>     | <b>Rank</b> |
| Employed                                | 251           | 88.4         | 1           |
| Self-employed                           | 9             | 3.2          | 4           |
| Entrepreneur                            | 14            | 4.9          | 2           |
| Househusband/Housewife                  | 10            | 3.5          | 3           |
| <b>Total</b>                            | <b>284</b>    | <b>100.0</b> |             |

### 3.2 Extent of Effects of Accessibility to Science Laboratories on the Performance of Grade Five Pupils as Perceived by Themselves with Respect to the Different Aspects

The findings show that accessibility to science laboratories has a very high extent of effect on pupils' academic performance, with a composite weighted mean of 4.80. Among the aspects, Problem Solving Skills obtained the highest rating (WM = 4.84), followed by Scientific and Critical Thinking (WM = 4.79), and Inquiry-Based Learning (WM = 4.78), all interpreted as very high extent. This indicates that pupils strongly perceive science laboratories as essential learning environments that significantly enhance their academic development, particularly in improving problem-solving abilities and critical thinking. The consistently high ratings across all indicators suggest that access to laboratory facilities plays a crucial role in promoting meaningful and engaging science learning experiences. This supports the idea that science laboratories are vital in developing essential scientific competencies and aligns with Marquez (2021), who emphasized that laboratory facilities provide practical, hands-on experiences that foster creativity, inquiry, and deeper understanding of scientific concepts.

Table 2

*Extent of Effects of Accessibility to Science Laboratories on the Performance of Grade Five Pupils as Perceived by Themselves with Respect to the Different Aspects*

| Aspects                                | W $\bar{X}$ | Verbal Interpretation | Rank |
|----------------------------------------|-------------|-----------------------|------|
| Scientific and Critical Thinking       | 4.79        | Very High Extent      | 2    |
| Problem Solving Skills                 | 4.84        | Very High Extent      | 1    |
| Inquiry Based Learning                 | 4.78        | Very High Extent      | 3    |
| <b>Composite W<math>\bar{X}</math></b> | <b>4.80</b> | Very High Extent      |      |

### 3.3 Significant Difference on the Extent of Effects of Accessibility to Science Laboratories on the Performance of Grade Five Pupils as Perceived by Themselves with Respect to the Different Aspects in Terms of Their Profile

The table reveals that there is no significant difference in the perceived extent of the effects of accessibility to science laboratories on the performance of Grade Five pupils when grouped according to their sex, sibling position, number of children in the family, monthly family income, and parents' educational attainment. This conclusion is based on the results of the F-test, where all calculated p-values are greater than the 0.05 level of significance, leading to the acceptance of the

null hypothesis across all variables and aspects assessed, namely scientific and critical thinking, problem-solving skills, and inquiry-based learning. This indicates that pupils regardless of gender, birth order, family size, economic background, or their parents' level of education—share similar perceptions regarding how access to science laboratories influences their academic performance. In other words, these personal and socio-demographic profiles do not appear to significantly alter how Grade Five pupils perceive the value or impact of laboratory access on their science learning and thinking skills. The findings imply that the positive effect of science laboratory accessibility is consistent across diverse learner profiles, underscoring its universal educational value. It strengthens the argument that improving access to science laboratories should be a standard educational priority, rather than a targeted intervention for specific groups. This also suggests that disparities in student performance in science may be more influenced by institutional resources and teaching strategies than by students' socio-demographic characteristics. The finding is supported by the study of Abidoye (2022) that influence of Basic science teachers on the performance of students in Upper Basic Schools in Kwara State, Nigeria differ significantly. It was also significant based on gender and years of teaching experience of Basic science teachers

Table 3

*Significant Difference on the Extent of Effects of Accessibility to Science Laboratories on the Performance of Grade Five Pupils as Perceived by Themselves with Respect to the Different Aspects in Terms of Their Profile*

| Aspects/Variables                       | F-value | p-value | Ho       | Verbal Interpretation |
|-----------------------------------------|---------|---------|----------|-----------------------|
| <b>Sex</b>                              |         |         |          |                       |
| Scientific and Critical Thinking        | 0.412   | 0.412   | Accepted | Not Significant       |
| Problem Solving Skills                  | 0.221   | 0.129   | Accepted | Not Significant       |
| Inquiry Based Learning                  | 0.656   | 0.331   | Accepted | Not Significant       |
| <b>Sibling Position</b>                 |         |         |          |                       |
| Scientific and Critical Thinking        | 0.076   | 0.997   | Accepted | Not Significant       |
| Problem Solving Skills                  | 0.034   | 0.994   | Accepted | Not Significant       |
| Inquiry Based Learning                  | 0.726   | 0.334   | Accepted | Not Significant       |
| <b>Number of Children in the Family</b> |         |         |          |                       |
| Scientific and Critical Thinking        | 0.265   | 0.856   | Accepted | Not Significant       |
| Problem Solving Skills                  | 1.228   | 0.305   | Accepted | Not Significant       |
| Inquiry Based Learning                  | 0.366   | 0.712   | Accepted | Not Significant       |
| <b>Monthly Family Income</b>            |         |         |          |                       |
| Scientific and Critical Thinking        | 0.671   | 0.746   | Accepted | Not Significant       |
| Problem Solving Skills                  | 0.653   | 0.769   | Accepted | Not Significant       |
| Inquiry Based Learning                  | 0.110   | 0.346   | Accepted | Not Significant       |
| <b>Fathers' Educational Attainment</b>  |         |         |          |                       |
| Scientific and Critical Thinking        | 0.517   | 0.219   | Accepted | Not Significant       |
| Problem Solving Skills                  | 0.875   | 0.342   | Accepted | Not Significant       |
| Inquiry Based Learning                  | 1.795   | 0.439   | Accepted | Not Significant       |
| <b>Fathers' Educational Attainment</b>  |         |         |          |                       |
| Scientific and Critical Thinking        | 0.758   | 0.324   | Accepted | Not Significant       |
| Problem Solving Skills                  | 1.745   | 0.119   | Accepted | Not Significant       |
| Inquiry Based Learning                  | 1.642   | 0.533   | Accepted | Not Significant       |
| <b>Fathers' Occupation</b>              |         |         |          |                       |
| Scientific and Critical Thinking        | 1.459   | 0.115   | Accepted | Not Significant       |
| Problem Solving Skills                  | 0.844   | 0.453   | Accepted | Not Significant       |
| Inquiry Based Learning                  | 1.021   | 0.212   | Accepted | Not Significant       |
| <b>Mothers' Occupation</b>              |         |         |          |                       |
| Scientific and Critical Thinking        | 1.444   | 0.115   | Accepted | Not Significant       |
| Problem Solving Skills                  | 1.021   | 0.112   | Accepted | Not Significant       |
| Inquiry Based Learning                  | 0.112   | 0.226   | Accepted | Not Significant       |



### 3.4 Level of Academic Performance of Grade Five Pupils as Revealed by their Average Grades in Science

The findings reveal that the majority of Grade Five pupils have a satisfactory academic performance in Science, with 190 pupils (66.90%) falling within the 80–84 grade range, followed by 91 pupils (32.04%) in the 85–89 range, 2 pupils (0.70%) in the 75–79 range, and only 1 pupil (0.35%) achieving an outstanding performance (90–100). The overall mean grade of 83.61 with a standard deviation of 1.845 indicates a generally consistent level of performance among the pupils. These results suggest that while learners are meeting expected competencies, there is still significant room for improvement. In relation to the accessibility of science laboratories, the findings imply that laboratory access contributes positively to pupils' academic performance but may not yet be fully maximized due to factors such as limited use, insufficient equipment, or inadequate integration into teaching practices. Enhancing access to and utilization of laboratory facilities could help improve pupils' performance from satisfactory to higher levels, promoting deeper understanding and better learning outcomes in Science. This supports Knowles (2022), who emphasized that access to scientific laboratories enhances learning by providing hands-on experiences, allowing students to construct knowledge and gain first-hand interaction with scientific concepts through experimentation.

Table 4

*Level of Academic Performance of Grade Five Pupils as Revealed by their Average Grades in Science*

| Grade              | Verbal Interpretation | Frequency  | Percent    | Rank |
|--------------------|-----------------------|------------|------------|------|
| 90-100             | Outstanding           | 1          | 0.35       | 4    |
| 85 – 89            | Very Satisfactory     | 91         | 32.04      | 2    |
| 80 – 84            | Satisfactory          | 190        | 66.90      | 1    |
| 75- 79             | Fairly Satisfactory   | 2          | 0.70       | 3    |
| <b>Total</b>       |                       | <b>284</b> | <b>100</b> |      |
| Highest Grade      | 90                    |            |            |      |
| Lowest Grade       | 79                    |            |            |      |
| Mean               | 83.61 ( Satisfactory) |            |            |      |
| Standard Deviation | 1.845                 |            |            |      |

### 3.5. Significant Relationship Between the Perceived Extent of Effects of Accessibility to Science Laboratories and the Level of Academic Performance of Grade Five Pupils

The results show a significant positive relationship between the perceived accessibility of science laboratories and the academic performance of Grade Five pupils in terms of scientific and critical thinking, problem-solving skills, and inquiry-based learning. The computed correlation coefficients ( $r = 0.754, 0.817, \text{ and } 0.695$ ) indicate strong positive relationships, while the p-values (all below 0.05) confirm that these relationships are statistically significant, leading to the rejection of the null hypothesis. This means that as pupils perceive greater access to and use of science laboratories, their academic performance in Science also improves, particularly in developing higher-order thinking skills and engaging in inquiry-based learning. The findings highlight that laboratory accessibility is not merely a supplementary factor but a crucial component in enhancing science learning outcomes. This has important implications for educators and school administrators, emphasizing the need to ensure that science laboratories are both accessible and effectively utilized in instruction to support meaningful learning experiences. The result is consistent with the findings of Alex (2021), who reported a remarkably strong positive correlation ( $r = 0.948$ ) between the use of laboratory facilities and students' academic performance in science-related subjects, reinforcing the significant role of laboratory-based learning in improving student achievement.

Table 5

*Computed r-Values on the Significant Relationship Between the Perceived Extent of Effects of Accessibility to Science Laboratories and the Level of Academic Performance of Grade Five Pupils*

| Aspects                          | r-values | p-values | H <sub>0</sub> | Verbal Interpretation |
|----------------------------------|----------|----------|----------------|-----------------------|
| Scientific and Critical Thinking | 0.754    | 0.026    | Rejected       | Significant           |
| Problem Solving Skills           | 0.817    | 0.012    | Rejected       | Significant           |
| Inquiry Based Learning           | 0.695    | 0.017    | Rejected       | Significant           |

### 3.6. Extent of the Problems Encountered in the Utilization of Science Laboratories in Selected Public Elementary Schools

It is shown from the table that the overall weighted mean for the problems encountered in the utilization of science laboratories is 1.80, interpreted as Seldom. Most of the identified problems were rated as Never, with only one problem rated as Seldom, one as Sometimes, and one as Always. Among the indicators, “Defective equipment” obtained the highest weighted mean of 4.95 (Always), followed by “Lack of sufficient time allocated for practical activities” with a weighted mean of 3.49 (Sometimes). On the other hand, “Limited water and electricity supply” (WM = 1.01) and “Inadequate or outdated learning materials” (WM = 1.00) were both interpreted as Never. These results indicate that, overall, problems in the utilization of science laboratories are seldom encountered, suggesting that the implementation and use of laboratory facilities in the selected public elementary schools are generally effective. This implies that schools have established systems that support the smooth integration of laboratory-based activities, allowing teachers to conduct hands-on and inquiry-based instruction with minimal disruption. However, the presence of some issues, particularly defective equipment and limited time for practical activities, indicates that certain challenges still exist and may affect the consistency and quality of laboratory instruction. This finding is consistent with Abas (2020), who reported that science teachers often encounter challenges such as inadequate facilities, defective equipment, and limited resources, which hinder effective science teaching and learning.

Table 6  
*Extent of the Problems Encountered in the Utilization of Science Laboratories in Selected Public Elementary Schools*

| Problems Encountered                                                           | W $\bar{X}$ | Verbal Interpretation | Rank |
|--------------------------------------------------------------------------------|-------------|-----------------------|------|
| 1. Lack of laboratory space                                                    | 1.38        | Never                 | 4    |
| 2. Insufficient equipment                                                      | 2.04        | Seldom                | 3    |
| 3. Defective equipment                                                         | 4.95        | Always                | 1    |
| 4. Inadequate or outdated learning materials, such as textbooks and guides     | 1.00        | Never                 | 10   |
| 5.. Limited water and electricity supply                                       | 1.01        | Never                 | 9    |
| 6. Lack of proper storage for chemicals and equipment                          | 1.02        | Never                 | 8    |
| 7. Insufficient or undocumented safety training for lab personnel and students | 1.04        | Never                 | 7    |
| 8. Inadequate storage of chemicals, including flammable substances             | 1.05        | Never                 | 6    |
| 9. Lack of safety equipment                                                    | 1.06        | Never                 | 5    |
| 10. Lack of sufficient time allocated for practical activities                 | 3.49        | Sometimes             | 2    |
| <b>Overall W<math>\bar{X}</math></b>                                           | <b>1.80</b> | <b>Seldom</b>         |      |

### Conclusion & Recommendations

The study concludes that demographic variables such as pupil’s sex, sibling position, number of children in the family, monthly family income, parents’ educational attainment, and parents’ occupations do not significantly influence the extent of the effects of accessibility to science laboratories on pupils’ academic performance. This indicates that access to science laboratories benefits learners regardless of their background. Furthermore, the findings reveal that the accessibility of science laboratories is significantly associated with pupils’ academic performance, highlighting the important role of laboratory-based learning in enhancing scientific understanding, critical thinking, and problem-solving skills among Grade Five pupils.

In light of these conclusions, it is recommended that school administrators prioritize the establishment and improvement of well-equipped and accessible science laboratories, particularly at the elementary level, to strengthen foundational science skills. Schools should also ensure that pupils have regular and structured access to functional laboratories. Teachers are encouraged to integrate laboratory activities into their daily lessons and adopt inquiry-based approaches to enhance learning. Additionally, science teachers should be provided with training and support to effectively implement laboratory-based instruction. The proposed action plan should be implemented to guide these efforts, and further studies may be conducted to explore other variables that may influence the relationship between laboratory accessibility and academic performance.

**Compliance with ethical standards**

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