Influence of Reading Abilities of Intermediate Pupils to Their Science and Mathematics Achievements

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Abstract:
Reading is a fundamental skill that underpins learning across all subject areas. Proficiency in reading allows students to comprehend, interpret, and apply knowledge effectively. In subjects such as Science and Mathematics, where complex texts and problem-solving are prevalent, reading difficulties can hinder academic performance. This study explores the relationship between the reading abilities of intermediate pupils and their academic achievements in Science and Mathematics. A descriptive research method was utilized at Pelingkingan Integrated School in the Division of Lanao del Norte. The study focused on Grade 5 and Grade 6 pupils, using a structured questionnaire to evaluate reading skills and academic performance. Frequency counts and weighted means assessed reading abilities and achievement profiles. The z-test examined differences in reading performance, while a t-test evaluated differences in achievement levels between the two grade levels. Reading abilities in word attack, location, and literary appreciation were average, but comprehension was below average. Science performance was satisfactory in both grades, while Grade 6 pupils performed better in Mathematics. Significant differences were found in certain reading skills but not in comprehension. Significant relationships were identified between reading skills and achievements in both Science and Mathematics, particularly in comprehension and word attack abilities. Reading abilities, especially comprehension, significantly influence pupils' academic achievements in Science and Mathematics. Strengthening reading skills is essential for improving performance in content-based subjects.

Keywords: reading comprehension, academic achievement, Science education, Mathematics performance, intermediate pupils, reading skills.

INTRODUCTION

Reading is a vital tool for learning. When a child struggles with reading, they face challenges in all learning areas because they find it difficult to assimilate and interpret information. This process involves multiple dimensions, including word perception, comprehension, thoughtful engagement, and integration of ideas. Proficiency in reading is a key indicator of academic success across subjects. In today's world, the ability to accurately interpret printed material is essential for effective learning. Unfortunately, many individuals lack the necessary reading skills to broaden their experiences, solve complex problems, and adapt to the fast-paced changes in our technology-driven society.

Reading ability is vital as it makes the reader appear intellectual, knowledgeable, and sophisticated in daily life (Akın, 2022). The ability to comprehend what the reader reads is called reading comprehension; it is when the reader can integrate what they understand. Knowing the meaning of words, being able to infer a word's meaning from its context, being able to follow the arrangement of a passage, and recognizing antecedents and references are all essential skills for effective reading comprehension. The ability of an individual to comprehend text in their minds is determined by their skill and ability to process information. This ability is the foundation for student academic achievement in school and, indeed, throughout life (Espia & Cortezano, 2022). Reading is a crucial macro-skill that underpins knowledge acquisition and critical thinking. Despite its

importance, the Philippines faces significant challenges in enhancing proficiency levels in reading, mathematics, and science, as highlighted by Chi (2023). The 2022 report from the Program for International Student Assessment (PISA) further emphasizes this issue, revealing concerning trends in student performance. This situation underscores the urgent need to address reading comprehension within the educational system, as effective reading skills are foundational for academic success and overall cognitive development.

The interconnectedness of reading, science, and mathematics is essential in today's educational curriculum; however, a significant research gap exists concerning the impact of reading proficiency on student performance in these subjects. Proficiency in reading is crucial for accessing and understanding information across various domains, including mathematics and science. Yet, studies in the Philippines indicate that many pupils struggle with reading skills, which limits their ability to broaden their experiences, solve practical problems, and grasp fundamental concepts. This deficiency not only affects their understanding but also contributes to poor performance in English-taught subjects, particularly in science and mathematics. Consequently, there is a pressing need to investigate the correlation between reading abilities and achievement in these disciplines, as existing literature has not adequately addressed this relationship.

The objective of this study is to explore the significant correlation between students' reading abilities and their performance in science and mathematics. By examining this relationship, the research aims to uncover insights that could inform educational strategies and interventions tailored to enhance reading skills among students. Understanding how reading proficiency influences achievement in these critical subjects may lead to more effective teaching methodologies and support systems that promote better academic outcomes. Ultimately, the study seeks to contribute to the body of knowledge on educational practices and provide actionable recommendations for educators and policymakers to address the challenges faced by students in the Philippines.

METHODS
Research Design
This study employed a descriptive research method, utilizing a questionnaire checklist as the primary data collection tool. In addition, the study incorporated field observations, library research, and unstructured interviews to gather comprehensive information. The combination of these methods provided both quantitative and qualitative data, enabling a well-rounded understanding of the research problem. The use of multiple sources of data allowed for triangulation, enhancing the validity and depth of the findings.

Research Setting
This study was conducted at Pelingkingan Integrated School in the Division of Lanao del Norte. The school offers pre-school and Grades I–VI education to a diverse population, with 38 teachers and 1,472 pupils, and is recognized as one of the top-performing schools in the division.

Research Respondents
The study involved a total of 202 respondents selected from 409 officially enrolled intermediate pupils. Using proportionate random sampling, 98 Grade Five pupils were selected from 199 enrollees, and 104 Grade Six pupils from 210 enrollees.

Research Instrument
The primary data gathering tool used in this study was a researcher-made questionnaire designed to assess pupils' academic performance across specific reading-related skill areas. The instrument consisted of 50 test items, with 10 items allocated to each of the following categories: word attack skills, study skills, comprehension skills, location skills, and literary appreciation skills. Each item was carefully constructed to evaluate students' proficiency in these domains, and the resulting data provided essential insights for the analysis. In addition to the test results, the final grades in Science and Mathematics of Grade 5 and Grade 6 pupils were retrieved from their official academic records maintained in the principal's office. These grades were used to supplement the questionnaire data and were interpreted using two performance scales. The three-point scale classified achievement as Above Average (2.34–3.00), Average (1.68–2.33), or Below Average

(1.00–1.67). Meanwhile, the five-point scale rated performance as Outstanding (4.21–5.00), Very Satisfactory (3.41–4.20), Satisfactory (2.61–3.40), Fair (1.81–2.60), or Poor (1.00–1.80).

Instrument Validity

To ensure the validity and reliability of the instrument, the questionnaire underwent a thorough evaluation process prior to its final administration. Initially, the draft instrument was submitted to a panel of experts in education and assessment, who reviewed the content for relevance, clarity, and alignment with the intended skill areas. Their feedback was used to revise ambiguous or inappropriate items to strengthen the content validity of the questionnaire. Following this expert validation, the revised instrument was pilot-tested among non-participating Grade 5 and Grade 6 pupils. The pilot test aimed to assess the clarity, appropriateness, and effectiveness of each item in measuring the targeted skills. Based on the analysis of the pilot results, further refinements were made to improve the structure, content, and overall quality of the instrument. This multi-step validation process ensured that the final version of the questionnaire was both valid and reliable for data collection within the context of the study.

Data-Gathering Procedure

Upon the completion and reproduction of the final version of the questionnaire, the researcher secured approval to conduct the study by requesting formal permission from the Schools Division Superintendent through the District Supervisor. An endorsement letter was then forwarded to the principal of Pelingkingan Integrated School, who granted the necessary authorization to proceed with data collection. The researcher personally administered the questionnaire to the selected Grade 5 and Grade 6 pupil-respondents to ensure clarity of instructions and accurate comprehension of the test items. Following the administration, the completed questionnaires were carefully checked and organized. The responses were then tallied, collated, and tabulated to facilitate accurate interpretation and comprehensive data analysis.

Ethical Considerations

This study followed the ethical principles outlined by Bryman and Bell (2007) to ensure research integrity and participant protection. Informed consent was obtained after clearly explaining the study's purpose, procedures, and potential risks or benefits. Participation was voluntary, and respondents were assured of their right to withdraw at any time without consequence. Anonymity and confidentiality were maintained by excluding personal identifiers and securely storing all data. The researcher also ensured that no harm or coercion occurred during data collection. Ethical clearance was obtained from the appropriate institutional body, affirming compliance with standard ethical research protocols.

Data Analysis

The data were analyzed using appropriate statistical tools to derive meaningful interpretations. Frequency count was used to identify the distribution of responses, while the weighted mean measured average performance levels in reading skills. The z-test assessed significant deviations from a hypothetical mean, and the t-test compared performance differences between Grade 5 and Grade 6 pupils in Science and Mathematics. Pearson Product-Moment Correlation was applied to examine the relationship between reading skills and academic performance, identifying the strength and direction of their association.

RESULTS AND DISCUSSION

Table 1 - Levels of Reading Abilities of Grade Five and Six Pupils in Pupils in Word Attack Skills

Pupils	AA	A	BA	WM	D
Grade V (n=98)	17	69	12	2.05	A
Grade VI (n=104)	79	68	17	2.02	A

Table 1 shows the levels of reading abilities of grade five and six pupils in word attack skills. A close examination of the table reveals that out of the 98 grade five pupils, 17 were classified as above average, scoring between 8 and 10. The majority of the respondents fell into the average category, with scores ranging from 5 to 7, while 12 pupils were identified as below average. The computed weighted mean of 2.05 corresponds to an average level, indicating that most pupils scored between 5 and 7 out of 10 items. This suggests that the grade five pupils demonstrated satisfactory performance in word attack skills.

In addition to the grade five pupils, 104 grade six pupils participated in this study and completed the ten-item test on word attack skills. Based on the test results, 19 pupils scored between 8 and 10, placing them in the above average category. The majority, 68 pupils, fell into the average category, with scores ranging from 5 to 7, while 17 pupils were classified as below average, having scores between 1 and 4. The calculated weighted mean of 2.02 indicates an average level of performance. This suggests that the grade six pupils, like their grade five counterparts, demonstrated satisfactory proficiency in word attack skills, with most achieving passing scores in the average range (5 to 7).

Table 2 - Level of Reading Abilities of the Grade Five and Six Pupils in Comprehension

Pupils	AA	A	BA	WM	D
Grade V (n=98)	10	26	62	1.45	BA
Grade VI (n=104)	14	30	60	1.56	BA

The data related to comprehension skills is presented in Table 2. A detailed analysis reveals that out of 98 grade five pupils, 10 were classified at the above-average level, with scores ranging from 8 to 10. An additional 26 pupils fell into the average category, scoring between 5 and 7. However, the majority of the respondents were categorized as below average, having achieved scores representing only half of the test items. The computed weighted mean of 1.45 indicates that the grade five pupils' performance in comprehension skills was generally average. This suggests that many pupils experienced difficulty with the test, as the majority scored lower than expected.

A similar trend is evident in the data for the grade six pupils. Like the grade five pupils, the grade six respondents also demonstrated below-average performance in comprehension skills. This is reflected in the computed weighted mean of 1.49, which falls within the below-average category. The results indicate that comprehension poses a significant challenge for these pupils. Only 14 pupils were classified as above average, while 30 were in the average category. Notably, these pupils were part of the top ten in the roll of honors. Although some pupils could understand the material at an average level, many struggled to provide precise interpretations of the statements. The results imply that topics related to comprehension require further clarification and instruction for these students.

This finding aligns with recent studies, such as that of Blasco et al. (2019), which states that students in classrooms receive academic content primarily transmitted through texts. This underscores the importance of reading development as a crucial means of learning for all individuals. In their study, the achievement in reading comprehension was categorized as below average, further highlighting the persistent difficulties pupils encounter in mastering comprehension skills.

Table 3 - Level of Reading Abilities of Grade Five and Six Pupils in Location Skills

Pupils	AA	A	BA	WM	D
Grade V (n=98)	17	63	18	1.98	A
Grade VI (n=104)	15	79	10	2.05	A

Table 3 illustrates the levels of reading skills in location skills among grade five and grade six pupils. According to the data, of the ninety-eight grade five pupils, only seventeen achieved nearly perfect scores, placing them in the above-average category with scores ranging from 8 to 10. In contrast, sixty-three pupils fell into the average category, with scores between 5 and 7. Eighteen pupils scored below half of the total items, classifying them in the below-average level. The computed weighted mean of 1.98 indicates that grade five pupils' performance in location skills is average. This suggests that while some pupils demonstrate strong abilities in locating key terms or statements within texts, the overall proficiency in this skill among grade five pupils remains limited.

Similarly, one hundred four grade six pupils participated in the test, with only fifteen achieving favorable results, categorizing them in the above-average level. Seventy-nine pupils scored between 5 and 7, placing them in the average category. Meanwhile, ten pupils performed unfavorably, scoring four or below, which classified them in the below-average category. The computed weighted mean of 2.05 indicates that grade six

pupils demonstrate an average level of proficiency in locating important items on the test. This suggests that while some students excel in identifying key terms, the overall understanding among grade six pupils remains moderate.

Table 4 - Levels of Reading Abilities of Grades Five and Six Pupils in Literary Appreciation

Pupils	AA	A	BA	WM	D
Grade V (n=98)	22	64	12	2.10	A
Grade VI (n=104)	22	72	10	2.12	A

Table 4 illustrates the levels of reading abilities among grade five and grade six pupils in literary appreciation. The results of this assessment correlate with those in the previous table, as both reflect an average level of reading skills. The data reveal that twenty-two grade five pupils achieved scores that categorize them within the average level of literary appreciation. Most of these pupils answered between 5 to 7 questions correctly, further confirming their classification as average. Conversely, only twelve grade five pupils scored below five, placing them in the below-average category. The computed weighted mean of 2.10 indicates that grade five pupils exhibit an average understanding of literary skills. This finding suggests that the pupils possess a satisfactory comprehension of the literature presented to them.

For the grade six pupils, twenty-two students answered between 8 to 10 items correctly, placing them in the above-average category. In contrast, seventy-two pupils scored between 5 to 7 correct answers, categorizing them as average. Additionally, ten pupils performed poorly on the test, achieving scores below four, which resulted in their classification as below average. The weighted mean of 2.12 indicates that grade six pupils performed at an average level overall. This finding suggests that the pupils demonstrated only moderate proficiency during the assessment.

As the grade six English teacher, the researcher had the opportunity to conduct interviews with the pupils, who expressed difficulties in understanding the literature. Many students reported that certain words in the selected texts were unfamiliar to them, contributing to their challenges in literary comprehension.

Table 5 - Achievement Level of the Four Areas of Reading Skills

Skill	Grade V		Grade VI	
	Mean	D	Mean	D
Word Attack Skills	2.05	A	2.02	A
Comprehension Skills	1.45	BA	1.56	BA
Location Skills	1.98	A	2.05	A
Literary Appreciation	2.10	A	2.12	A
General Weighted Mean	1.90	A	1.94	A

Table 5 summarizes the performance of grade five and six pupils across five reading skills. For the grade five pupils, the average scores in word attack skills, location skills, and literary appreciation skills were 2.05, 1.98, and 2.10, respectively, indicating an average performance in these areas. However, their study skills and comprehension skills were categorized as below average. Overall, the grade five pupils exhibited an average level of reading abilities, with a general average weighted mean of 1.90. This suggests that they possess a satisfactory understanding of what they read.

In contrast, the grade six pupils demonstrated below-average performance in comprehension skills but performed at an average level in the other skills. Their average performance reflects their ability to understand word attack, location, and literary appreciation skills in reading. The overall reading abilities of grade six pupils were categorized as average, with a general average weighted mean of 1.94.

Given the dearth of published research correlating the three essential ESL variables—reading habit, reading comprehension, and academic performance in the Philippine primary pedagogical context—Madrazo and Francisco (2019) conducted a study to determine the levels of these variables among 150 Grade V pupils.

They found that the pupils' reading habits positively correlated with both their reading comprehension and academic performance, further underscoring the importance of these skills in educational outcomes.

Table 6 - Level of Achievement of the Grades Five and Six Pupils in Science

Pupils	O	VS	S	F	P	WM	D
Grade Five (n=98)	12	15	60	8	3	3.26	S
Grade Six (n=104)	10	14	57	14	9	3.02	S

Grade Five Pupils. This study includes a total of seventy-four grade five pupils. Among them, twelve students achieved grades between 94 and 100, categorizing them in the outstanding level. Fifteen pupils fell into the Very Satisfactory category, with grades ranging from 88 to 93 percent. A larger group of sixty pupils received grades between 80 and 87, classifying them as Satisfactory. In the Fair category, eight pupils obtained grades ranging from 75 to 79 percent, while three pupils received failing grades below 74 percent, placing them in the Poor level of achievement. The computed weighted mean of 3.26 indicates a "Satisfactory" performance overall. This suggests that grade five pupils demonstrate an average level of science achievement.

Grade Six Pupils. Among the one hundred four grade six pupils, ten achieved grades between 94 and 100, placing them in the "Outstanding level". Fourteen pupils were categorized as Very Satisfactory, with grades ranging from 88 to 93 percent. Additionally, fifty-seven pupils scored between 80 and 87 percent, classifying them as Satisfactory. Fourteen pupils earned grades between 75 and 79 percent, indicating a Fair level of achievement, while nine pupils failed the subject. The computed weighted mean of 3.25 reflects a Satisfactory performance overall. This indicates that grade six pupils exhibited a similar level of achievement as their grade five counterparts. It suggests that grade six pupils may struggle to fully grasp the lecture material and science activities, potentially due to difficulties encountered in understanding the subject matter.

Table 7 - Level of Achievement of Intermediate Pupils in Mathematics

Pupils	O	VS	S	F	P	WM	D
Grade Five (n=98)	10	18	60	10	-	3.29	S
Grade Six (n=104)	13	25	68	8	-	3.41	VS

Grade Five Pupils. Table 7 presents the mathematics achievement levels of grade five pupils. Out of the ninety-eight pupils, ten achieved grades ranging from 94 to 100 percent, categorizing them at the outstanding level. Eighteen pupils scored between 88 and 93 percent, placing them in the Very Satisfactory category. The majority, sixty pupils, earned grades ranging from 80 to 87 percent, which is classified as Satisfactory. Lastly, ten pupils achieved grades between 75 and 79 percent, falling under the Fair level of achievement. The computed weighted mean of 3.29 reflects a satisfactory level overall, indicating that grade five pupils performed satisfactorily in mathematics.

Grade Six Pupils. There were one hundred four grade six pupils included in this study. Thirteen of them were classified in the "outstanding level" with their grades ranging from 94 - 100 percent. However, twenty five pupils got the grades of 88 - 93 which falls on the very satisfactory level. Moreover, fifty eight pupils were able to get the grades ranging from 80 - 87 and they are classified in the satisfactory level and finally eight pupils belonged to the fair category with the grades ranging from 75 - 79 percent. None of the respondents got poor grades. The computed weighted mean was 3.41 which falls on the very satisfactory level. This means that the grade six pupils did their best in mathematics, hence very satisfactory performance. This further means that the grade six pupils taught the subject which they are expected to acquire in the standard level set.

Table 8 - The Z-test Computation of the Reading Abilities of Grade V Pupils

Skill	No. of Items	HM	AM	SD	Computed Z	D
Word Attack Skill	10	7.5	8.14	10.20	.54	A
Comprehension Skill	10	7.5	6.45	12.02	.75	BA
Location Skill	10	7.5	7.93	10.32	.36	A
Literary Appreciation	10	7.5	7.54	10.59	.03	A

The performance of grade five and grade six pupils was analyzed using the z-test, with a hypothetical mean of 75 percent serving as the benchmark. The findings are presented in Tables 8 and 9. It was hypothesized that there is no significant difference between the hypothetical mean and the actual mean of the grade five pupils' reading abilities across five reading skills tested.

Word Attack Skills. The hypothetical mean for word attack skills was 7.5, while the actual mean was 8.14, with a standard deviation of 10.2. The computed z-test value was 0.54, which is less than the critical value of 1.96 at the 0.05 significance level. As a result, the null hypothesis of no significant difference between the hypothetical and actual means is not rejected. This indicates that there is no significant difference, and the pupils' achievement in word attack skills falls within the average range.

Comprehension Skills. For comprehension skills, the hypothetical mean was 7.5, while the actual mean was 6.45, with a standard deviation of 12.02. The computed z-test value was 0.75, which is also less than 1.96 at the 0.05 level of significance. Therefore, the null hypothesis is not rejected, indicating no significant difference between the hypothetical and actual means. Consequently, the pupils' comprehension skills are categorized as below average, demonstrating a lack of competence in this area.

Location Skills. Similarly, in location skills, the hypothetical mean was 7.5, and the actual mean was 7.93, with a standard deviation of 10.32. The computed z-test value was 0.36, which is less than the critical value of 1.96 at the 0.05 significance level. The null hypothesis is not rejected, confirming no significant difference between the hypothetical and actual means. Pupils' reading abilities in location skills are categorized as average, as the actual mean exceeds the hypothetical mean slightly, indicating average performance.

Literary Appreciation. In literary appreciation, the hypothetical mean was 7.5, while the actual mean was 7.54, with a standard deviation of 10.59. The computed z-test value was 0.03, which is less than the critical value of 1.96 at the 0.05 significance level. As a result, the null hypothesis is not rejected, indicating no significant difference between the hypothetical and actual means in literary appreciation. The pupils' performance in literary appreciation is considered average, with an actual mean just above the expected 75 percent.

Table 9 - The Z-test Computation of the Reading Abilities of Grade Six Pupils

Skill	No. of Items	HM	AM	SD	Computed Z	D
Word Attack Skill	10	7.5	8.24	9.34	.63	.63
Comprehension Skill	10	7.5	7.14	11.21	.26	.26
Location Skill	10	7.5	8.18	9.14	.59	.59
Literary Appreciation	10	7.5	8.12	10.26	.48	.48

It was hypothesized that there would be no significant difference between the hypothetical mean and the actual mean of grade six pupils' reading achievement. The z-test was used to either reject or fail to reject this hypothesis. Four reading skills were tested, and the results are shown in Table 9.

Word Attack Skills. According to the table, the hypothetical mean was 7.5, while the actual mean was 8.24, with a standard deviation of 9.34. The computed z-test value was 0.63, which is less than the critical value of 1.96 at the 0.05 level of significance. Therefore, the null hypothesis is not rejected, indicating that there is no significant difference between the hypothetical and actual means. This suggests that the pupils' achievement in word attack skills falls within the average category, with pupils achieving 75 percent mastery of these reading abilities.

Comprehension Skills. In comprehension skills, the hypothetical mean was 7.5, while the actual mean was 7.14, with a standard deviation of 11.21. The computed z-test value was 0.26, which is less than the critical value of 1.96 at the 0.05 level of significance. Consequently, the null hypothesis is not rejected, indicating no significant difference between the actual and hypothetical means. The pupils' achievement in comprehension skills was below average, as they failed to reach the expected 75 percent performance and did not achieve the

expected scores of 50 percent or more. Grade six pupils demonstrated poor performance in comprehension skills.

Location Skills. For location skills, the hypothetical mean was 7.5, while the actual mean was 8.18, with a standard deviation of 9.14. The computed z-test value was 0.59, which is less than the critical value of 1.96 at the 0.05 level of significance. As a result, the null hypothesis is not rejected, indicating no significant difference between the actual and hypothetical means. Grade six pupils performed satisfactorily on the location skills test, as their performance exceeded the 75 percent expected grade.

Literary Appreciation. The test on literary appreciation consisted of ten items, with the hypothetical mean set at 7.5. The actual mean was 8.12, with a standard deviation of 10.26. The computed z-test value was 0.48, which did not exceed the critical value of 1.96 at the 0.05 level of significance. Therefore, the null hypothesis is not rejected. Although the actual mean was greater than the hypothetical mean, grade six pupils at City Central School were classified at the average level in their literary appreciation skills. This indicates that while pupils were learning, they did not fully acquire the above-average skills expected by the standard, resulting in merely satisfactory performance.

Table 10 - Difference between the Grades Five and Six Pupils' Performance in Reading Abilities

Skills	Grade Level	N	Mean	SD	DM	Computed z
Word Attack Skills	V	98	2.05	3.90	.07	2.09^{*}
	VI	104	2.02	3.76		
Comprehension Skills	V	98	1.45	2.92	.08	$.42^{ns}$
	VI	104	1.56	2.87		
Location Skills	V	98	1.98	3.40	.15	2.15^{*}
	VI	104	2.05	3.90		
Literary Appreciation Skills	V	98	2.10	3.82	.12	2.19^{*}
	VI	14	2.12	3.49		

The difference in reading abilities between grade five and grade six pupils was analyzed using a t-test. It was hypothesized that there would be no significant difference in the reading performance between the two groups.

Table 10 shows the computed mean difference and t-values across five areas of reading abilities. The null hypothesis was rejected in three areas, except for comprehension skills, where the computed t-value of 1.42 did not exceed the critical value of 1.98 at the 0.05 level of significance. This indicates that there was no significant difference in the comprehension performance of grade five and grade six pupils, as the weighted means for both groups were very similar.

However, the hypothesis was rejected in the areas of word attack skills, location skills, and literary appreciation skills, where the computed t-values were 2.09, 2.15, and 2.19, respectively, exceeding the critical value of 1.98 at the 0.05 level of significance. This suggests a significant difference between the two groups' performance in these areas of reading abilities. Grade six pupils performed better than grade five pupils, likely due to their advanced knowledge and experience as compared to their younger peers. The grade six pupils had already encountered similar processes in previous years, giving them an advantage in these skills.

Table 11 - Difference between the Grades Five and Six Pupils' Achievement in Science

Pupils	N	Mean	SD	DM	Computed t
Grade V	98	3.26	6.49	0.24	1.82^{ns}
Grade VI	104	3.02	7.12		

* - significance at .05   ns - not significant

Table 11 presents the computed mean difference and t-values for the science achievement of grade five and grade six pupils, revealing that grade five pupils had a mean of 3.26 with a standard deviation of 6.49, while grade six pupils had a mean of 3.50 with a standard deviation of 7.12, resulting in a mean difference of 0.24

in favor of grade six pupils. However, the t-test indicated no significant difference between the two groups at the 0.05 level of significance, leading to the conclusion that the academic performance in science for both grade five and grade six pupils was similar; this finding aligns with Cairns (2019), who suggested that learning outcomes are more significantly influenced by teaching strategies and learning resources than by grade level alone.

Table 12 - Difference between the Grades Five and Six Pupils' Achievement in Mathematics

Pupils	N	Mean	SD	DM	Computed t
Grade V	98	3.29	6.52	.12	2.42*
Grade VI	104	3.41	6.32		

　　　* - significance at .05　　　　　　ns - not significant

Table 12 depicts the computed t-values and the mean difference between the two groups of respondents. The grade five pupils had a mean of 3.29 with a standard deviation of 6.52, while the grade six pupils had a mean of 3.41 and a standard deviation of 6.32. The computed mean difference is 0.12, and the computed t-value is 2.42. Since the t-value exceeds the tabled value of 1.98 at the .05 level of significance, there is a significant difference between the achievements of grade five and grade six pupils in Mathematics, leading to the rejection of the null hypothesis.

These findings align with the expectation that higher-grade students generally perform better than their lower-grade counterparts. In this study, grade six pupils demonstrated superior performance in Mathematics compared to grade five pupils.

This outcome is supported by recent research by Wang et al. (2023), which emphasizes that higher grade levels are associated with improved academic performance in Mathematics due to increased exposure and instructional quality.

Table 13 - Relationship between Reading Abilities and Science Achievement of Intermediate Pupils

Areas	Mean	SD	Computed r	Computed t
Word Attack Skills	2.06	3.80	0.283	*
and Science and Achievement	3.30	5.41		3.43
Comprehension Skills	1.53	3.03	0.417	*
and Science Achievement	3.30	5.41		6.20
Location Skills	2.00	3.71	0.341	*
and Science Achievement	3.30	5.41		4.22
Literary Appreciation Skills	2.11	3.53	0.223	*
and Science Achievement	3.30	5.41		2.65

Table 13 presents the relationship between reading abilities and science achievement among intermediate pupils. It was hypothesized that there is no significant relationship between the reading abilities of intermediate pupils and their achievement in Science. The correlational analysis revealed that all reading skills had a significant relationship with science achievement.

The findings showed that the computed correlation coefficient (r) exceeded the critical value of 0.24, and when further subjected to the t-test, the resulting t-values were also found to be greater than the critical value of 1.98 at the .05 level of significance. This indicates that there are significant relationships between reading abilities—specifically in word attack skills, comprehension, location, and literary appreciation—and intermediate pupils' science achievement. Thus, the hypothesis of no significant relationship is rejected.

The general implication is that pupils' reading abilities in word attack, comprehension, location, and literary appreciation are essential for success in studying science. Their achievements in science are influenced by these reading skills, particularly comprehension skills, which are crucial for understanding scientific concepts. This is evidenced by the correlation coefficients exceeding the critical values of 0.24 for r and 1.98 for t-values.

This finding is consistent with research by McBreen and Savage (2021), which indicated that reading proficiency significantly influences students' performance in Science and Mathematics. The study found that students who struggle with reading are likely to face challenges in their academic achievement across various subjects.

Table 14 - Relationship between Reading Abilities and Mathematics Achievement of Intermediate Pupils

Areas	Mean	SD	Computed r	Computed t
Word Attack Skills	2.06	3.80	0.470	7.53*
and Science and Achievement	3.45	5.28		
Comprehension Skills	1.53	3.03	0.490	4.07*
and Science Achievement	3.45	5.28		
Location Skills	2.00	3.71	0.251	3.01*
and Science Achievement	3.45	5.28		
Literary Appreciation Skills	2.11	3.53	0.195	2.81*
and Science Achievement	3.45	5.28		

The results of the computation using the coefficient of correlation are presented in Table 14. As shown in the table, all areas of reading skills—namely, word attack skills, comprehension skills, location skills, and literary appreciation skills—are significantly correlated with intermediate pupils' achievement. The computed correlation coefficients for these variables were significant at the .05 level, and when subjected to a t-test, the t-values of 4.125 were found to be significant at the same level. This indicates that relationships exist between the five areas of reading abilities and pupils' mathematics achievement.

This clearly implies that pupils' mathematics achievement is associated with their reading abilities, where reading comprehension and vocabulary are crucial for solving mathematical problems. If students struggle to understand word problems, they may fail to grasp the directions necessary to solve them, leading to proficient readers achieving better results in mathematics. Recent studies support these findings; for instance, Akın (2022) found that reading comprehension has a significantly strong effect on students' mathematics skills, with problem-solving identified as the strongest moderator of this relationship. Additionally, the effects varied among different groups, favoring elementary students, those with learning disabilities, and second language learners, while geometry was noted as the weakest moderator in the association between mathematics skills and reading comprehension.

CONCLUSIONS AND RECOMMENDATIONS
Conclusion
The two groups of respondents demonstrated poor comprehension skills, indicating a limited ability to understand and interpret questions in common problems. Their understanding of words and sentences was also low. While grade six pupils performed better than grade five pupils in Mathematics, both groups exhibited similar levels of performance in Science. The achievement of pupils in Mathematics is significantly influenced by their reading comprehension abilities. Furthermore, skills such as word attack, comprehension, location, and literary appreciation are all related to pupils' achievement in Science. Overall, the reading abilities of intermediate pupils play a critical role in their success in Mathematics.

Recommendation
Based on the findings and conclusions of the study, it is recommended that classrooms implement word banks and essential mathematical fact charts to support student understanding and retention. Mathematics instruction should be made more engaging through the use of visual aids, group activities, and hands-on materials that relate to real-life situations. Teachers are encouraged to recognize individual learning differences by grouping students according to ability and providing differentiated tasks for both high achievers and those needing additional support. Reading teachers should adopt effective strategies to enhance students' comprehension skills, while all educators should promote good study habits and a positive attitude toward learning. Lastly, parents are encouraged to provide a variety of reading materials at home to support and enrich their children's literacy development.

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