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The Impact of Reading Levels to the Mathematics Achievement of Grade Four Learners in Davao Central District

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Abstract — Reading levels are really important for seeing how well students understand texts, and they often mirror their grade level and overall proficiency. Recently, an interesting study took place during the 2023-2024 school year, focusing on the reading skills of 200 fourth graders in the Davao Central District and how these skills connect to their performance in math class. This research was inspired by John Piaget's Theory of Constructivism, which emphasizes the significance of active learning and appreciating individual perspectives. The findings from the study showed that, on average, these students were reading at an instructional level. This suggests a clear need for schools to implement engaging and effective reading programs to help students improve their skills. In terms of math performance, the fourth graders were doing fairly well, indicating that they possess some basic skills. However, they still encounter challenges when it comes to deeper understanding, critical thinking, and solving complex problems. Interestingly, the study uncovered that math performance varied significantly based on reading levels. This indicates that several elements—including teaching methods, classroom environments, and individual student characteristics—play a crucial role in how well students succeed in math.

Keywords — Reading levels, Student understanding, Fourth graders, Davao Central District, Math performance, Active learning, Instructional level

I. Introduction

Reading skills are essential for students as they navigate their educational paths. They serve as a mirror reflecting not only a student's grade level but also their overall grasp of language. For those learning English, grasping the nuances of the language becomes even more critical, especially when faced with subjects like math, which often include word problems that can be tricky. When students struggle with reading, it complicates their ability to solve math problems and can also make it difficult for them to express their thoughts clearly.

In the Davao Central District, teachers are attentive to their students' reading abilities, evaluating aspects like vocabulary and sentence structure, as well as the complexity of the materials they're working with. These assessments enable educators to tailor their teaching strategies, ensuring they meet the diverse needs of each student. It's evident that strong reading skills are essential for tackling math challenges; students who find reading tough often experience similar hurdles in math.

In Slovenia, many children from low-income backgrounds grapple with basic reading skills, which can create significant obstacles in their education and limit their future opportunities. Research from Indonesia has shown a strong connection between cognitive skills and math performance, underscoring the importance of engaging with more complex math concepts to enhance learning.

In India, disparities in math achievement often mirror students' social backgrounds and the resources they have access to. Addressing these inequalities is crucial, and expanding access to quality education can help create a more equitable landscape for all students.

Back in the Philippines, many students struggle with reading proficiency, which in turn affects their overall academic success. There's an urgent need for improvements, such as enhanced teacher training and greater community involvement, to help bridge these gaps. Numerous studies indicate that quality teaching, a nurturing learning environment, and the ability to self-regulate are all key factors in improving math performance.

In Mindanao, primary school students are facing reading challenges that could hinder their academic progress. This situation emphasizes the need to identify these difficulties early on so students can receive the support they require. Additionally, there's a noticeable lack of research on how reading proficiency impacts math achievement. This study seeks to fill that gap by investigating the relationship between reading levels and math performance, with the goal of uncovering insights that could enhance educational practices for students in the future.

This study set out to explore how reading levels relate to math achievement among fourth graders in the Davao Central District during the 2023–2024 school year. It aimed to shed light on some key questions about how these two subjects impact one another and contribute to the overall learning journey of the students:

1. What is the distribution of reading levels among grade four learners in

   Davao Central District:

   1.1 Independent reading level;

   1.2 Instructional reading level; and

   1.3 Frustration reading level.

2. What is the level of Mathematics performance of grade four learners in

   Davao Central District?

3. Do grade four learners in Davao Central District from frustration, instructional, and independent reading level have significant differences on scores in mathematics achievement?

Literature Review

In this part, we're going to explore some significant literature and research related to our topic. We'll take a deeper look at various studies that offer valuable insights to guide our exploration and assessment. To keep things clear and organized, we'll focus on two main areas: reading levels and mathematics achievement. By examining these studies closely, we hope to gain a better understanding of how these two areas are linked and how they influence each other.

II. Methodology

This part of the study outlines the incredible places we visited and introduce you to the wonderful people we met throughout our adventure. We discovered so much, and I want to shine a light on the useful tools that helped us gather all our insights. I'll also explain the different methods we used to collect our data, as well as how we made sense of what we found. My aim is to take you through each step of the process, giving you a personal glimpse into the adventures that shaped our study.

Research Design - The study explored how fourth graders in the Davao Central District are developing their reading skills and how these might influence their performance in math. The researchers chose to take a non-experimental quantitative approach, focusing on collecting and analyzing numerical data to better understand the situation.

This research was divided into two key parts. In the first part, the team aimed to create a clear picture of the students' reading abilities by gathering data from local elementary schools. This step was crucial for understanding how well students are currently reading. In the second part, the researchers looked into whether there were notable differences between students' reading skills and their math performance. This was particularly significant as it sought to determine if stronger reading skills might contribute to better outcomes in math. By combining descriptive and comparative methods, the study offered important insights for various educational stakeholders, such as policymakers and school administrators. The findings could inform improvements in reading strategies and help enhance math achievement in schools across the Davao Central District. Overall, this research serves as a valuable resource for making informed decisions in education.

Ethical Consideration - In our upcoming study, we want to prioritize the safety and well-being of everyone involved, especially the Grade 4 students from the Davao Central District. It's important to us that our approach is warm and welcoming. We'll make sure to clearly explain to the students what it means to participate in this study, ensuring they feel comfortable and informed. We'll be examining existing data about the students' reading levels from the Phil-IRI assessment and their achievements in math. We care deeply about their privacy and will handle all the information responsibly, following the Data Privacy Act of 2012.

Our dedication to ethical principles is unwavering. We believe in informed consent, privacy, fairness, and transparency. This means we'll keep the data anonymous and stored safely. To ensure everyone has a fair chance, we'll randomly select participants. As a small thank-you for their involvement, we'll offer some incentives and certificates. The study will be led by a qualified researcher who will work closely with an adviser to uphold the highest standards of integrity. We understand how vital it is to connect with our community and respect the diverse cultural, racial, and religious backgrounds of everyone.

Ultimately, our goal is to use the insights we gain from this study to inform policies and improve educational programs in reading and math. We genuinely care about making a positive difference in the educational experience for all the students involved and are excited about the journey ahead.

Research Locale - The research took place in the vibrant Davao Central District of Davao City, which is the largest area in Region XI. Davao City is a lively hub divided into three main districts—Districts I, II, and III. Each district is home to various neighborhoods, all overseen by dedicated Public Schools District Supervisors (PSDS). These supervisors are crucial in ensuring that both public and private schools within their areas operate smoothly. Davao City boasts a total of 170 private schools and 76 public elementary and high schools, thanks to the tireless commitment of these educators.

In Davao City, education is significantly shaped by the Department of Education (DepEd), which embraces a more holistic approach to student development. Here, the focus goes beyond just achieving high test scores; schools prioritize nurturing core values, essential life skills, and social abilities that enhance the well-being of their students. DepEd schools work hard to develop well-rounded individuals. They blend academic learning with character-building activities, extracurricular programs, and opportunities for engaging with the community. The ultimate goal is to empower students to confidently face future challenges while supporting their intellectual, emotional, and social growth, helping them become responsible and active members of society.

Research Respondents - The study made effective use of a variety of resources, which really streamlined the research process. By tapping into a mix of materials like reports, articles, government documents, statistics, and archived sources, the researcher could focus more on analyzing the data rather than getting stuck in the collection phase. However, it's crucial to assess the reliability, validity, and relevance of this information to ensure it directly answers the research question. As Creswell (2018) remind us, not all data carries the same weight.

For this research, the team intentionally chose 200 Grade Four students from schools in the Davao Central District for the 2023-2024 academic year. To determine the right number of participants, they used Slovin's formula, which is an effective way to figure out sample sizes within larger populations. This approach helps ensure that the sample reflects the wider group while keeping the number of participants manageable. Slovin's formula is particularly valuable in

educational research because it allows for efficient data collection without needing to survey everyone, leading to statistically significant results (Bobbit, 2023). Careful thought went into selecting both the participants and the research locations to ensure everything aligned with the research question.

To enhance the study's credibility, the researcher combined purposive and random sampling methods. Purposive sampling involves choosing participants based on specific criteria that are crucial for the study, ensuring that those who can contribute meaningful insights are included. On the other hand, random sampling gives a truly random selection of participants, which helps reduce bias and makes the findings more relevant to the wider population. Creswell points out that blending these two methods can be a powerful strategy for obtaining a representative sample while also exploring particular characteristics in depth. For example, in a large quantitative study, researchers might use random sampling for broad representation while applying purposive sampling within smaller groups to highlight distinct traits or behaviors (Creswell, 2018).

Research Instrument - In our study, we set out to examine how learners' reading abilities relate to their performance in math. Instead of starting from scratch, we decided to look at existing data. This approach helped us uncover meaningful connections between two crucial areas of education without needing to conduct new research.

Using already available data offers several advantages. It allows researchers to spot long-term trends, making the process more efficient and cost-effective than collecting fresh data. By analyzing large datasets from different regions and time periods, we were able to compare various groups and track changes over time (Johnston, 2014). However, we did face some challenges. It was essential for us to ensure that the data we worked with was high-quality, valid, and relevant. Using outdated or irrelevant data could have compromised the credibility of our findings (Liu, 2018). Despite these hurdles, we discovered that secondary data can be incredibly valuable in education. For example, assessments like the Philippine Informal Reading Inventory (Phil-IRI) enabled us to explore how students' reading skills might be linked to subjects like math (Gagno, 2022).

In our analysis, we focused specifically on the reading levels of fourth-grade students as assessed by the Phil-IRI. This tool evaluates the reading skills of Filipino learners by classifying their proficiency into three categories: independent, instructional, and frustration.

At the independent reading level, students can confidently read and understand texts on their own, demonstrating good accuracy and fluency. The instructional level indicates that while students can engage with texts, they may still require some support; they typically recognize about 90-95% of the words correctly and comprehend around 70-89% of the content. In contrast, the frustration level is where students struggle significantly, understanding less than 70% of the material and accurately recognizing fewer than 90% of the words. This level often leads to significant difficulties in grasping the content, even with extra help (Cabardo, 2015).

Research Instrument - In our study, we examined the Philippine Informal Reading Inventory (Phil-IRI) to understand how Grade 4 students are doing in reading and math. By analyzing existing data, we could identify trends over time without the hassle of gathering new information, which was a real time-saver for us. We prioritized using data that is both reliable and relevant.

The Phil-IRI divides reading proficiency into three categories: independent, instructional, and frustration. An "independent" reader has about 90-95% accuracy, showing strong fluency. If a student falls into the "instructional" level (70-89% accuracy), they might need some help. Unfortunately, those in the "frustration" category (below 70%) are really struggling. To better understand this data, we used a 3-point Likert scale that matched these reading levels, which made our findings clearer.

Scale	Descriptive Value	Interpretation
90-95	Independent Level	This indicates that the reading level of students demonstrates high fluency and comprehension.
70-89	Instructional Level	This indicates that the reading level of students needs some teacher support in comprehending and reading text.
Below 70	Frustration Level	This indicates that the reading level of students demonstrate struggle to understand even when provided guidance.

We'll evaluate students' math achievement based on their recent grades from assignments and assessments. The grading scale is: 90-100 is Outstanding, 85-89 is Very Satisfactory, 80-84 is Satisfactory, 75-79 is Fairly Satisfactory, and below 75 means expectations weren't met. Additionally, we'll use a 5-point Likert scale to get more nuanced insights from the results.

Scale	Descriptive Value	Interpretation
90-100	Outstanding	This indicates that the mathematics achievement is outstanding.
85-89	Very Satisfactory	This indicates that the mathematics achievement is very satisfactory.
80-84	Satisfactory	This indicates that the mathematics achievement is satisfactory.
75-79	Fairly Satisfactory	This indicates that the mathematics achievement is fairly satisfactory.
Below 75	Did not meet expectation	This indicates that the mathematics achievement did not meet expectation.

Research Procedure - When I first set out on my research journey, it hit me how important it was to approach data collection with care and respect, especially towards the individuals involved. One of the biggest challenges I faced was getting approval for my study. I can still vividly remember the overwhelming sense of relief when I finally held my research ethics certificate. It was more than just a document; it represented my strong commitment to ethical principles and the critical need to protect the dignity of my participants.

After securing that approval, my next step was to obtain an endorsement letter from the Dean of the Graduate School. With the unwavering support from my thesis advisor, I felt more confident moving forward. I was excited to dive into the exploration of how reading levels could influence mathematics achievement among fourth graders in the Davao Central District schools. Realizing I needed solid backing for my project, I reached out to the school's division superintendent of Davao City. To my delight, I received additional support from the Davao Central District supervisor.

With those endorsements in hand, I approached the principals of the schools I wanted to include in my research. In my letters, I made it a priority to clearly communicate how many fourth-grade teachers I needed for my study. Building transparency and trust from the very beginning was incredibly important to me. As I entered the data collection phase, I made sure to take the time to explain everything thoroughly to the teachers. I stressed that our main focus would be on the results from the Philippine Informal Reading Inventory (PHIL-IRI) for Grade Four learners. It was essential for them to understand the purpose of my research and why their insights were so valuable. By using the PHIL-IRI—a widely respected tool for assessing reading proficiency—I hoped to gain meaningful and reliable insights into the students' reading abilities.

Collaboration with the school faculty and administration proved to be crucial. Their support not only simplified my work but also fostered a sense of honesty and integrity that strengthened the credibility of my findings. The data I collected, which included individual scores and reading levels, was essential for analyzing the students' performance in reading. Once the data collection was complete, I focused on meticulously organizing and securing all the information, ensuring everything was accurate as I progressed with my study. The fourth-grade teachers were instrumental during this phase; their help in obtaining precise information about their students was invaluable. After administering the PHIL-IRI and gathering all the necessary data, I carefully arranged it to ensure it was coherent and comprehensive.

Once I had everything organized, I collaborated with a skilled statistician who guided me through the analysis process. Using the Statistical Package for the Social Sciences (SPSS), we applied the appropriate statistical methods to interpret the data. This partnership allowed me to clarify the findings in a structured way, leading to significant insights. Utilizing SPSS not only enhanced the accuracy of my analysis but also added a level of rigor to the entire study.

III. Results and Discussion

Table 1. Distribution of reading levels of Grade Four Learners

Reading Levels	n	Mean	Descriptive Interpretation
Independent reading level	200	89.44	Students need some teacher support in comprehending and reading text.
Instructional reading level		82.28	Students need some teacher support in comprehending and reading text.
Frustration reading level		77.20	Students need some teacher support in comprehending and reading text.
Overall		83.32	Students need some teacher support in comprehending and reading text.

The average score of 83.32 places most Grade 4 students at the Instructional level, indicating they need guidance to read independently. This highlights the need for effective reading programs to support student growth.

Table 2. Level of Mathematics Performance

Variable	n	Mean	Descriptive Interpretation
Mathematics Performance	200	83.32	This indicates that the mathematics achievement is Satisfactory.

Grade Four learners scored an average of 83.32 in mathematics, placing them at the Satisfactory level.

Table 3. One-Way ANOVA on the Significant Difference of Learners Mathematics Performance

	Sum of Squares	df	Mean Square	F-value	p-value	Decision on H_o
Between Groups	4938.565	2	2469.283	638.963	.000	Reject
Within Groups	761.310	197	3.865			
Total	5699.875	199				

Significant difference in mathematics performance across different reading levels, with a p-value of less than 0.05.

The study focused on how reading skills impact math performance among fourth graders in the Davao Central District during the 2023-2024 school year. The aim was to gather solid evidence regarding the connection between students' reading abilities and their math scores.

In summary, the findings revealed some interesting insights. On average, the students were reading at an instructional level, meaning that many of them could benefit from a bit more support to help them read independently. When it came to math, they performed reasonably well on a

recent assessment. However, what stood out was the notable difference in math performance based on the students' reading levels. This led the researchers to conclude that there is a significant link between reading proficiency and math skills.

IV. Conclusion

This study really shines a light on how students are engaging with learning in today's world and provides some thought-provoking insights. For starters, it looks like many students are operating at what educators refer to as the Instructional level. This highlights the need for schools to adopt reading programs that not only capture students' interest but also cater to their individual learning styles. Getting every student engaged is crucial for their growth and development. When we turn our attention to fourth graders' math skills, the news is quite promising. They seem to be doing well overall, landing in the Satisfactory range. This suggests they have a solid grasp of the basics, but there's an important challenge ahead: we need to make sure they're pushed enough to develop their critical thinking and advanced problem-solving abilities.

One particularly interesting finding is the evident link between students' reading levels and their performance in math. It highlights how various factors—like teaching strategies, the classroom environment, and each child's unique personality—play a significant role in their success in math. This really reinforces the idea that our teaching methods should be adaptable and tailored to meet the diverse needs of our students. Lastly, if we consider Piaget's Theory of Constructivism, we see a valuable perspective: students learn best when they're actively involved in their education. The results of this study back that up. When students have opportunities to explore new concepts, engage their senses, and connect what they're learning to their own experiences, their understanding deepens significantly. It's evident that those who excel in reading also tend to excel in solving word problems and following instructions, underlining the strong connection between reading and math skills.

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