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Enhancing reading comprehension through MIND instructions: An experimental study on Grade 4 learners

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ABSTRACT

A learner's ability to comprehend and derive meaning from text is essential for developing critical thinking, memory retention, and problem-solving skills. Despite its importance, reading comprehension among Grade 4 learners at Faustino Reyes Memorial Elementary School remains a challenge. This study employed an experimental design with a two-group pretest-posttest framework to examine the effectiveness of MIND (Multimedia, I-learning, Navigable Delivery) instructions in improving reading comprehension skills for 14 Grade 4 learners during the academic year 2025–2026. Learners were randomly assigned to a control group, which received conventional teaching methods, and an experimental group, which underwent weekly MIND instruction integrating multimedia presentations, interactive activities, and navigable exercises. Pretests and posttests were administered, and the data were analyzed using mean scores and independent t-tests. Results indicated that the experimental group significantly outperformed the control group, achieving a mean score of 17.36 (Advanced level) compared to 9.93 (Approaching Proficiency). The increase in the experimental group was statistically significant ($t = 8.50 > t\text{-crit} = 2.160$, $\alpha = 0.05$). These findings demonstrate that the MIND instructional strategy effectively enhances reading comprehension by fostering engagement, higher-order thinking, and learner-centered practice. The study recommends integrating MIND instructions into regular reading lessons and replicating the intervention across different contexts to assess its broader applicability.

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Introduction

Reading is widely recognized as a fundamental skill that enables learners to achieve their academic goals and realize their life aspirations. As a core component of language development, reading serves as a

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gateway to knowledge acquisition and intellectual growth. Central to this skill is reading comprehension—the ability to construct meaning from text—which is essential for academic success and lifelong learning (Duncan, 2021). Beyond the classroom, reading proficiency equips learners with critical thinking and problem-solving skills necessary for personal development and active participation in society (Ag, 2017).

In the Philippines, the development of reading proficiency remains a critical concern within the basic education sector. Despite ongoing educational reforms and literacy programs, national and international assessments continue to reveal significant gaps in learners' reading abilities. Data from the Program for International Student Assessment (PISA) 2018 highlight this challenge, with Filipino learners achieving an average reading score of 340, substantially below the Organization for Economic Co-operation and Development (OECD) average of 487. This disparity underscores the urgency of strengthening instructional practices and implementing effective interventions to improve reading comprehension among Filipino learners.

In response, the Department of Education (DepEd) has intensified efforts to address literacy challenges through various initiatives. During the Brigada Pagbasa Summit, former DepEd Secretary VP Sara Duterte emphasized that reading without comprehension limits learning, reinforcing the need to prioritize meaningful literacy development. This is reflected in DepEd's 3B Program, which highlights reading comprehension as a key focus in addressing foundational learning gaps. Despite these initiatives, many learners continue to struggle with comprehension, underscoring the need for more targeted and innovative instructional approaches.

Empirical studies further demonstrate the long-term impact of reading comprehension on learners' academic trajectories. Findings from the Progress in International Reading Literacy Study (PIRLS) reveal that learners who fail to develop strong comprehension skills by Grade 4 are more likely to encounter difficulties across subject areas (Mullis et al., 2017). Similarly, local studies indicate that Filipino learners, particularly at the intermediate level, experience challenges in understanding texts, which subsequently affects their performance in subjects such as Science and Mathematics (Bernardo, 2020). These findings highlight the importance of strengthening reading instruction during the critical transition stage in elementary education.

Globally, research points to the effectiveness of integrating visual and interactive learning strategies in improving reading comprehension. The use of technology-enhanced instruction has been shown to increase learner engagement and facilitate deeper understanding of texts. Studies conducted in countries such as Malaysia demonstrate that technology-integrated lessons significantly improve learners' comprehension by aligning instructional practices with contemporary educational demands (Karthigesu & Mohamad, 2020; Rafiq & Hashim, 2018; Yunus et al., 2020). Moreover, interactive learning approaches—such as collaborative discussions and problem-solving activities—have been found to enhance comprehension outcomes (Nind et al., 2021). Learners who utilize digital tools and interactive platforms also tend to outperform those exposed to traditional instructional methods (Lee & Day, 2022).

Reflecting these broader educational challenges, the need to strengthen reading comprehension is evident at the local level. At Faustino Reyes Memorial Elementary School (FRMES), results from the Functional Literacy Assessment Tool (FLAT) indicate varied levels of reading proficiency among Grade 4 learners. Specifically, several learners remain at the paragraph and story levels, with only a few reaching the story-plus-comprehension level. This variation highlights the necessity for differentiated and innovative instructional strategies that can address the diverse learning needs of students.

While previous studies have established the effectiveness of technology integration and interactive approaches in improving reading comprehension, there remains a gap in localized interventions tailored to learners' specific contexts. Limited research has examined structured instructional approaches that integrate multimedia, learner autonomy, and guided navigation to enhance comprehension skills in elementary learners.

To address this gap, the present study proposes implementing MIND instruction—an approach that integrates Multimedia, i-learning, and Navigable Delivery to improve the reading comprehension of Grade 4 learners at FRMES. This approach aims to create an engaging, learner-centered environment that supports diverse reading levels while promoting active participation and independent learning. The findings of this study are expected to contribute to the development of context-based instructional strategies, provide insights for improving reading programs, and support ongoing efforts to enhance literacy outcomes among elementary learners.

Review of related literature and studies

This section provides a review of related literature and studies on topics relevant to this research, with a specific focus on the effectiveness of MIND instruction, which includes Multimedia, i-learning, and Navigable Delivery, in enhancing reading comprehension among elementary learners. It examines existing studies on the integration of multimedia tools in literacy instruction, the role of technology-supported and learner-centered approaches in improving engagement and comprehension, and the impact of structured and navigable learning materials on learners' independent reading development. Additionally, this section highlights empirical evidence on interactive and digital learning strategies that support struggling readers, as well as the implications of these approaches for improving reading outcomes in elementary education.

The complexity of full comprehension

Fast and accurate word reading is hypothesized to facilitate reading comprehension by freeing a reader's cognitive resources (e.g., working memory) to focus on meaning (Wolf, 2011). When word recognition is slow and labored, cognitive load is occupied at the expense of understanding text. Given the connection between efficient reading of connected text and comprehension, researchers over the past several decades have highlighted the importance of fluency instruction (Bashir & Hook, 2012).

According to Chard et al. (2012), oral reading fluency engages children in learning to read words and texts with age-appropriate word accuracy, reading speed, and voice inflection or expression. By the fourth grade, most children will be able to read most words and most texts on their own (OECD, 2013).

Reading fluency is strongly emphasized in schools today and continuously assessed. This attention is important, given that fluency is positively correlated with comprehension (Chard et al., 2012). According to Stecker et. al. (2018), fluency has been shown to have a reciprocal relationship with comprehension. However, the multifaceted components of genuine fluency have often been neglected when tools used to measure it have focused on a single dimension—namely, speed or words read correctly per minute (Chard et al., 2012). Genuine reading fluency is marked by a synchronous combination of word recognition accuracy, confidence, appropriate pacing, and smooth flow (i.e., appropriate expression, voice pitch, intonation, word phrasing, and word emphasis) (Rasinski, 2013).

Teaching children to read fluently is one of the main goals of early childhood education because reading serves primary aims: achieving one's goals, developing one's knowledge and potential, and participating in society (OECD, 2013). Reading is a fundamental skill for school achievement (Hulme & Snowling, 2011), as evidenced by studies documenting the persistence of reading disorders across the life span (Harvey & Goudvis, 2010). Strategies: Reading fluency and comprehension are closely interrelated and correlated with important aspects of academic life, such as school outcomes and training success (Álvarez-Cañizo et al., 2015).

After primary school, teachers tend to focus on reading comprehension, neglecting the fostering of students' reading fluency, the influence of which is believed to fade on school outcomes. However, this assumption has recently been challenged, and the importance of reading fluency in adolescence has been re-evaluated (Zoccolotti et al., 2014). Moreover, recent literacy theories have documented how text use differs across academic domains (Moje, Birr et al., 2010), and reading strategies might become less generalizable as students move into increasingly specific disciplinary knowledge areas at higher school levels (Shanahan & Shanahan, 2008). This study analyzed the independent contribution of reading fluency to predicting school outcomes across several subjects, after controlling for the effect of reading comprehension, in Italian students at three school levels: primary, secondary, and high school.

Meanwhile, research indicates that at least one in five students has significant difficulty with reading acquisition (Therrien, 2014). Although reading fluency and comprehension are important skills to acquire, as they are essential skills for success both in school and later in life, many children do not acquire the necessary skills for achieving proficiency.

According to a study, 40% of fourth graders lack the skills and knowledge to adequately perform the necessary grade-level work (Bursuck et al., 2014). Similarly, Calhoon (2015) found that 59% of fourth-grade students are performing below a basic literacy level on standardized reading tests. In addition, as children age, data show that proficiency levels remain a concern. 31% of boys and 21% of girls in eighth grade did not reach a basic literacy level on a standardized test (Calhoon, 2015).

Problems with reading tend to begin at the onset of reading instruction, persist, and become more severe over time (Graney, 2010). Furthermore, most schools do not detect fluency or comprehension difficulties until the second or third grade (McCardle et al., 2011) because the reading skills emphasized until the third grade are phonemic and not grounded in fluency and comprehension. As students reach high school

age, research shows fluency does not increase, although comprehension does improve (Calhoon, 2015). Research also indicates gender differences in the risk for difficulties in reading comprehension, with male students experiencing more difficulty than female students (Linnakyla et al., 2014).

To increase the reading fluency and comprehension of students who encounter such problems, various strategies, such as assisted reading, reading while listening, and paired reading, have been implemented. Research addressing the effectiveness of these strategies implemented individually, however, shows mixed results. In contrast, programs that combine the three previously mentioned strategies into a single technique increase reading fluency and comprehension (Therrien, 2014). Additional factors that help improve reading skills include: appropriate grouping practices, instructional strategy, extended practice opportunities with feedback, and breaking down tasks into smaller components (Calhoon, 2015). The findings show all factors are associated with substantial improvements in reading.

Indeed, increasing fluency is a key way of increasing a student's comprehension skills. Teachers can use a variety of methods to increase reading fluency. When teachers incorporate different ways of learning, they help reach a wider range of students. Many students learn best one way, but others need to learn the same information through varying learning styles. This also benefits students who need increased repetition in different ways. Saying the words accurately and fluently does not guarantee understanding of an author's message. Chard et al. (2012) contend that comprehension lies more in the non-visual information we supply from within our heads rather than in the visual information that bombards us from the print; such non-visual information constitutes our full schema on the particular topic.

As well, the general depth and breadth of one's background knowledge has been noted to be a critical factor in comprehension; these have a significant impact on readers' ability to make gap-filling inferences, predict, make logical connections, and perform other higher-level thinking skills when interacting with texts (Cromley et. al., 2017). As students' experiences differ, so too will the meanings they construct when engaging with text, meaning shaded by personal connections and elaborations. In classrooms across countries, meanings constructed with text will naturally reflect the cultural, linguistic, social, economic, ethnic, racial, and family differences across readers.

However, developing students' reading fluency alone is insufficient, as students with low comprehension levels may still have difficulty with decoding and/or understanding aspects of reading (Irwin, 2017). Catts et al. (2012) found that weaknesses in oral language (i.e., semantic processing, grammatical skills, and inferring) accounted for variance in comprehension when decoding was not a problem; difficulties in any combination of these aspects negatively impact reading comprehension (Elwer, 2014). To ameliorate comprehension difficulties, interventions that apply research-tested strategies and instructional approaches to increase students' competence in both word and meaning processing hold promise.

Phil-IRI: An assessment tool for reading comprehension

The Philippine Informal Reading Inventory (Phil-IRI) is an initiative of the Bureau of Learning Delivery, Department of Education, that directly addresses its thrust to make every Filipino child a reader. It is

anchored in the Department's flagship program, "Every Child A Reader Program," which aims to make every Filipino child a reader and a writer at his/her grade level.

The Phil-IRI is an informal reading inventory consisting of graded passages designed to assess an individual student's performance in oral reading, silent reading, and listening comprehension. These three types of assessments aim to find the student's independent, instructional, and frustration levels. The data from these measures could be used to design or adjust classroom, small-group, or individualized instruction to meet students' needs and abilities.

The revised Phil-IRI was prepared in early 2013, prior to the introduction of the K-12 Curriculum. The readability levels of the selections for oral and silent reading were based on the old English and Filipino curricula and were validated by pupils who were products of these curricula; they were taught to read in Filipino and English starting in Grade 1. Under the K-12 curriculum, pupils are introduced to Reading in Filipino in the first semester of Grade 2, while reading in English is introduced in the second semester. (Phil-IRI Manual, 2018).

The Phil-IRI is not the sole assessment tool for assessing students' holistic reading performance; it only provides an approximation of students' abilities and can be used in combination with other reliable assessment tools. The data shall also serve as one of the bases for planning and designing/redesigning the school's reading programs or activities to improve overall school reading performance.

Reading comprehension competencies for Grade 4 Filipino learners

The world is now in the knowledge age, where the challenge of education is to prepare learners to navigate the changing world. Students in this age must be prepared to compete in a global economy, understand and operate complex communication and information systems, and apply higher-level thinking skills to make decisions and solve problems (Calhoon, 2015).

DepEd's current Language Arts and Multiliteracies Curriculum (LAMC) under the K+12 Program addresses these needs by providing learners with a wide array of opportunities to acquire and embody specific communication skills.

These competencies are developed among students in an integrated way, using relevant print and non-print resources to provide multiple perspectives and meaningful connections. To ensure that pupils attain, nurture, and improve these skills, the curriculum stresses that learning tasks and activities will be designed to give pupils time to reflect on and respond to ideas and information. Moreover, learners will be provided with sufficient scaffolding to reach their full cognitive, affective, and psychomotor potential and become independent learners who are good consumers and constructors of meaning.

In the context of reading, the LAMC emphasizes the development of reading comprehension competencies among Grade 4 pupils, particularly on reading fluency and making meaning. In terms of reading fluency, these include reading grade-four-level texts with intonation, expression, and punctuation, and reading grade-level, frequently occurring content-area words with automaticity.

Meanwhile, the reading comprehension competencies for Grade 4 pupils are analyzing a narrative in terms of the short story elements like theme, setting, characters, plot, and conflict; analyzing a 3-4-line poem in terms of its elements such as rhymes and sound devices); inferring the theme of literary texts; raising questions based on text heard; identifying main idea, key sentences and supporting details of a given paragraph; making an outline from a selection read; identifying text-types according to purpose (e.g. to classify or describe, recall a series of events, explain); identifying figures of speech (e.g. onomatopoeia, assonance, alliteration, simile, metaphor, and personification); analyzing lead of a news report; noting significant details; identifying various text-types according to structure (e.g. enumeration, cause and effect, time order, problem and solution, comparison and contrast); making generalizations; using appropriate graphic organizers for texts read; interpreting the messages of the different authentic texts (e.g. product labels, medical prescriptions, pamphlets, illustrations, maps, and symbols); evaluating a variety of literary texts; and evaluating a variety of informational texts.

Status of reading comprehension skills of elementary Filipino learners

In the Philippines, efforts to promote literacy are encouraged by the government, organizations, and even private individuals, as the ability to read and write is considered a top priority (Cristobal, 2015). In a speech delivered by the Department of Education's Literacy Coordinating Council OIC, Dina Ocampo, during the 2014 National Literacy Conference and Awards, she emphasized the role of literacy in empowering an individual to interact within the community and to realize his worth and what he can do to contribute to the development of society.

According to the results of the 2010 Census of Population and Housing from the National Statistics Office, 97.5% of the 71.5 million individuals aged 10 years and older were literate, representing a significant increase from the 2000 CPH record of 92.3%.

The Department of Education has various literacy-specific initiatives aimed at improving the literacy rate among students. These are "Every Child A Reader Program (ECARP)", "The Library Hub", "a focus in K-3 Curriculum language development", "The Mother Tongue-Based Multilingual Education (MTB-MLE)", "Journalism program under Republic Act 7079", and lastly, activities throughout the year which include Book Week and National Reading Month (Cristobal, 2015).

Reading is the true backbone of most learning, be it math, science, or even home economics; hence, it is immeasurably important. It is expected that as students climb the educational ladder, reading becomes more demanding as subjects become denser and more challenging. A study revealed that individuals bring knowledge and skills to their jobs and future studies.

Despite the emphasis on the importance of reading, the Philippine Informal Reading Inventory (Phil IRI) Oral Reading results in 2010 show declining reading proficiency, especially in the primary grades. This claim was supported by a previous study, which found that the official performance tests administered to high school students in the 2004-2005 school year showed that only 6.59 percent could read, speak, and understand English (Imam, 2016). Some 44.25 percent did not know English.

In addition, Magistrado (2015) questions why the Philippines remains poor despite its high literacy rate and finds that Filipinos are not a reading populace. The consumption of reading materials is far behind that of Asian neighbors. Numerous studies and surveys indicate that many students have difficulty comprehending what they read. All schools need to have a remedial reading program to help struggling students. Through the program, students will develop reading as a habit.

Magistrado (2015) also noted that children learn only half of what they are supposed to learn in school. The low readership in the Philippines and the dismal performance of pupils on reading tests demonstrate the failure of many local schools to foster the aims of reading education effectively. People's survival and satisfaction in today's age of information explosion depend largely on their ability to read and write proficiently and critically.

Reading is a fundamental skill, and the earlier students receive interventions, the greater the impact on their studies, and the better they will be able to cope. Reading alone is of little value if students cannot draw out the meaning of what they read. If the schools address the issue, it will be a win-win solution. Through remediation, the students will be able to read and comprehend, and the schools will be able to serve their purpose — to teach.

Strategies to improve poor reading comprehension

Students with learning disabilities in reading, including dyslexia, often have difficulty comprehending text in books and other reading materials written at their grade level. This can occur for several possible reasons.

First, the material may be written at a level beyond their current independent reading skill. Second, they may have limited prior knowledge of the content being read or a limited vocabulary. This can lead to confusion during reading and in a class discussion about what is being read. Third, they may not be aware of how the reading material is structured, such as the elements of story structure, the organization of the material in a textbook, or the characteristics of the genre of literature being read. Fourth, the meaning of sentences and passages may become lost as the reader struggles with the mechanics of reading. This makes it difficult to remember what was read. Fifth, they may have difficulty determining what information is important in written passages.

There are many strategies to use to improve reading comprehension in struggling readers, and these include the following:

KWL (sometimes called the “cool method”) – This is an activity that teaches students to think about how they are reading and what they are reading before, during, and after the reading task. The KWL chart is a worksheet with three columns. The K column is for the student to record what is already known about the subject. The W column is for recording what the child wants to know about the subject, and the third L column is for what the child actually learned from reading the passage.

Summarizing is an activity where the student thinks about what she has read. In summarizing, the student is asked to identify the main idea of a written passage. It can be done verbally by having the child explain

orally what a passage was about. It can also be done in written paragraph form or on a graphic organizer. The most important aspect of summarizing is ensuring the child can identify who or what the passage is about and its main idea.

The PQ4R method (Preview, Question, Read, Reflect, Recite, Review) is a good way to improve comprehension and recall of what was read. Use the PQ4R strategy with new reading material to improve comprehension and retention, which can lead to better grades and greater achievement across all school subjects.

Explicit Comprehension Strategy Instruction is one of the most effective approaches to improve reading comprehension. According to the National Reading Panel (2000), teaching students how to summarize, question, clarify, and predict significantly improves comprehension outcomes. Similarly, Duke and Pearson (2002) emphasize that effective comprehension instruction requires direct explanation, teacher modeling, guided practice, and independent application. Learners benefit when teachers explicitly demonstrate “thinking aloud” while reading to show how skilled readers make meaning from text.

Multimedia and storytelling videos have been shown to enhance reading comprehension, particularly among struggling readers. Mayer’s (2001) Cognitive Theory of Multimedia Learning explains that learners process information more effectively when verbal and visual inputs are combined. This dual-channel processing supports deeper understanding and retention. Digital storytelling, especially when localized or culturally relevant, strengthens engagement and activates background knowledge. Research suggests that video-supported instruction helps learners visualize narrative structure, understand vocabulary in context, and improve inferential comprehension (Robin, 2008). Multimedia tools are particularly effective in supporting diverse learners, including those with limited exposure to print-rich environments.

Reading comprehension in the local context

Mante (2009), as cited in Ilustre (2011), sought to identify factors affecting the reading comprehension of Filipino bilingual high school students in English. The objective of her paper was twofold: first, to determine and measure the participants' dimensions of motivation to read; and second, to identify the relationships among the participants' motivation to read in English, their reading comprehension, and their use of metacognitive reading strategies when reading in the same language. Results were inconclusive regarding whether reading motivation or the use of metacognitive reading strategies more strongly affects reading comprehension, as no single predictor accounted for the reading test scores.

On the contrary, Anderson (1994), as cited in Lastrella (2010), presented that the recall of information in a text is affected by the reader’s schemata and explains that a reader comprehends a message when he can bring to mind a schema that gives an account of the objects and events described in the message. Reading comprehension also lies in the student’s interest in reading. “Reluctant readers tend to gradually lose some academic ground because wide reading is related to increases in general knowledge and reading comprehension” p. 31- 32) (Williamson, 1988, in Seitz, 2010).

Furthermore, the study by Kelcey (2010) suggests that schools are associated with differences in teachers' knowledge. By comparing teachers with similar personal and school backgrounds, results showed that measured knowledge is significantly associated with students' achievement in reading comprehension.

In an article written by Dr. Linda Silbert, dated November 11, 2014, she cited that there are factors that cause poor reading comprehension, which are the following: Disinterest, struggling with decoding individual words, text is too difficult for a child's reading level, deficit in working memory, which is common with kids with ADHD, visual processing disorder, and limited vocabulary. Poor reading comprehension leads to poor grades. This is because when kids do not understand what they read, it affects their ability to succeed in school. All subjects, including science and math, require reading comprehension. Even tests and exams require good reading comprehension, which results in low grades and poor test scores if a student has poor reading comprehension.

Silbert (2014) also noted signs of poor reading comprehension. First is the inability to answer questions about what they just read. Second is the inability to understand the logical sequence of a story. Third is the inability to tell the story after reading it. Fourth is the inability to connect individual sentences or paragraphs of text to make sense of what they have read. Fifth is a lack of knowledge of the meaning of individual words. Last is a lack of interest in reading or a tendency to give up quickly.

Several studies cited by Sayse (2017) in the article "Importance of Reading Comprehension in Second Language Learning" revealed significant findings. First, Pigada & Schmitt (2006) explored whether an extensive reading program could enhance lexical knowledge and assessed 133 words. They examined whether one month of extensive reading enhanced knowledge of the spelling, meaning, and grammatical characteristics of these target words. The results showed that knowledge of 65% of the target words was enhanced in some way. Spelling improved significantly, even after a small number of exposures. Meaning and grammatical knowledge were also enhanced, but not to the same extent. Overall, the study indicated that more vocabulary acquisition is possible from extensive reading than previous studies have suggested.

Second, Sewjee (2008) writes that reading may play a more important role than speaking and listening for a learner, as without reading, he cannot achieve his goals. While reading a book, he can travel all around the world from his seat, make contact with all kinds of people, and encounter all sorts of dialects. He learns to distinguish between good and bad and acquires a wide range of information, which helps him become a better speaker and writer. Moreover, Bilbao et al. (2016) found that the overall reading comprehension of Education students is Satisfactory, with a descriptive level of Moderate. This means that students can understand difficult reading texts under literal, interpretive, evaluative, and creative levels with less supervision. Consequently, the respondents' year levels differed significantly when grouped by year level. However, when grouped according to sex, the results show that it did not establish any significant difference.

Similarly, in Paz's (2018) study, no significant relationship was found between participants' profiles, reading factors, and their reading comprehension level. This gave way to addressing some levels of

reading comprehension that were weak, namely interpretative, critical, and application, which require an appropriate intervention program.

Also, in another study by Imam (2016), students' overall performance in reading comprehension and science was at a low level of mastery. Generally, four out of six reading skills, such as understanding vocabulary in context, noting details, predicting outcomes, and making inferences, made up the overall reading skills that positively correlated with the science performance of students, although the strength of the relationship was considered weak.

Another study conducted by Ancheta (2019) found that teacher-respondents were moderately knowledgeable about the nature of reading and content-area reading instruction. As to the frequency of implementing reading strategies in their content areas, three strategies are often employed by the teacher-respondents: building prior knowledge, mapping graphic representations, and posing discipline-relevant questions. In terms of their readiness for blended training programs, they were found to be strongly ready across all indicators. In addition, Ancheta (2019) stated that the researcher identified common problems in content-area reading instruction through unstructured interviews. These include a lack of knowledge and skills, limited or insufficient training for teachers in content-area reading instruction, the need to deliver content, and resistance to implementing and integrating reading instruction and strategies across their content areas. The activities employed by the teacher-respondents for each discipline-specific reading strategy were also identified through unstructured interviews.

According to Paris and Hamilton (2009), as cited in Ancheta (2019), research has shown that reading comprehension can be significantly improved when taught explicitly. Further, Presley (2006) posited that, because meaning does not exist in the text but must be constructed by the reader, instruction in reading strategies is necessary to improve comprehension.

Specifically, Fang and Coatam (2013) stressed that teachers should implement reading strategies to increase students' comprehension of text. These include providing effective vocabulary instruction in their subject areas; teaching reading comprehension strategies that help students make sense of content-area texts; designing reading assignments likely to motivate students who lack engagement in school activities; and teaching students to read in ways distinct to their own content areas.

Also, in a study by Lao (2018) entitled *Computer-Assisted Language Learning (CALL) Worktext in Speech and Oral Communications*, she found that the teacher respondents believed that a worktext is very much needed; thus, instructional materials for teaching Speech and Oral Communication are much needed. Moreover, the student's perception of their mastery of subject-area competencies is average, indicating a need to improve their oral communication skills.

Conceptual framework

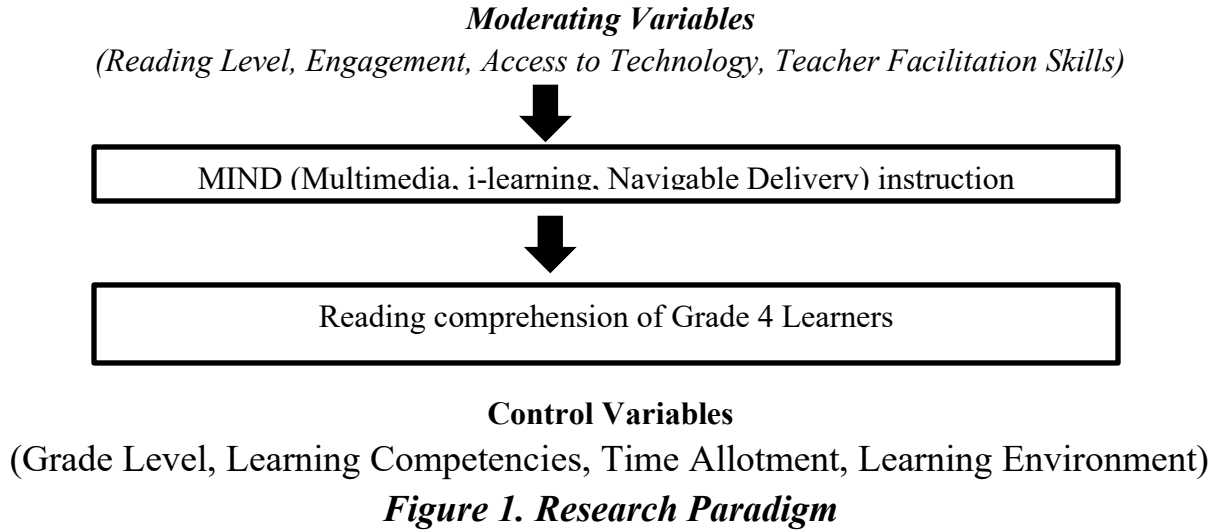


Figure 1. Research Paradigm

Figure 1 illustrates the conceptual framework of the study, based on the Independent Variable-Dependent Variable (IV-DV) model, which examined the effect of MIND instruction on learners' reading comprehension. Specifically, the independent variable (IV) was the MIND instruction, which includes Multimedia, i-learning, and Navigable Delivery, implemented to enhance the teaching and learning process. The dependent variable (DV) was the reading comprehension of Grade 4 learners, specifically their ability to understand texts, identify key details, and demonstrate comprehension skills.

The study also considered factors that may influence the intervention's effectiveness, including learners' reading levels, engagement, access to technology, and teachers' facilitation skills. In addition, control variables such as grade level, learning competencies, time allotment, and learning environment were maintained to ensure that any observed improvement in reading comprehension could be attributed primarily to the implementation of MIND instruction.

Statement of the problem

This study aimed to improve the reading competence of Grade 4 Learners through Multimedia, i-learning, and Navigable Delivery (MIND) instruction. Specifically, this study sought answers to the following questions:

1. What is the level of reading comprehension skills of Grade 4 learners, both in experimental and control groups, before the MIND instructions?
2. What is the level of reading comprehension skills of Grade 4 learners, both in experimental and control groups, after the MIND instructions?
3. Is there a significant difference in the level of comprehension skills of Grade 4 learners before and after using the MIND instructions?

Research methodology

Research design

This study employed a quasi-experimental research design to determine the effect of MIND instruction on the reading comprehension of Grade 4 learners. A quasi-experimental approach, as explained by Creswell (2014), is used to examine cause-and-effect relationships where random assignment is not feasible. This design is appropriate for the study as it allows the researcher to implement an instructional intervention and measure its impact on learners' reading comprehension. Through this approach, the study assessed the effectiveness of MIND instruction, which integrates multimedia, i-learning, and navigable delivery, in improving learners' ability to understand texts, identify key details, and demonstrate comprehension skills.

Research setting

The study was conducted at Faustino Reyes Memorial Elementary School (FRMES), located within the Schools Division of Laoag City. The school was selected as the research setting because it provides a relevant context for examining reading comprehension among Grade 4 learners, particularly given the results of the Functional Literacy Assessment Tool (FLAT), which indicate varying levels of reading proficiency. This setting enables the implementation of MIND instruction in a real classroom environment where diverse reading needs are evident.

Research participants

The participants in the study were Grade 4 learners from Faustino Reyes Memorial Elementary School. A total of fourteen (14) learners were purposively selected based on their FLAT results, which identified their varying levels of reading proficiency, including paragraph, story, and story-with-comprehension levels. The selection of participants was intentional to ensure that the intervention would address learners with diverse reading needs. The sample size was considered appropriate for close monitoring of learners' progress and for generating meaningful data on the effectiveness of MIND instruction in improving reading comprehension.

Data gathering instrument

The primary instrument used in this study was a researcher-made reading comprehension test aligned with the Grade 4 learning competencies. The test was designed to assess learners' ability to understand texts, identify key details, and demonstrate comprehension skills before and after the implementation of MIND instruction. The instrument was validated by experts in English and reading instruction to ensure its content validity and appropriateness for learners' level.

In addition, the Functional Literacy Assessment Tool (FLAT) results were used to determine participants' initial reading levels. Instructional materials based on MIND instruction, including multimedia presentations, interactive digital activities, and structured, navigable modules, were also developed and used as part of the intervention.

Data gathering procedure

The study employs a quasi-experimental design, specifically the one-group pretest-posttest design, to assess the effect of MIND (Multimedia, i-learning, Navigable Delivery) instruction on Grade 4 learners' reading comprehension. This design enables direct measurement of progress by comparing learners' comprehension levels before and after the intervention, allowing the researcher to analyze the specific impact of MIND instruction.

Pretest Administration: The study begins with administering a pretest to gauge the baseline reading comprehension skills of all participating Grade 4 learners. This pretest consists of a 20-item multiple-choice reading comprehension test, created by the researcher. The test targets comprehension skills relevant to Grade 4 reading standards, including identifying main ideas, inferring details, and interpreting vocabulary in context. To maintain consistent conditions, the pretest is administered in a controlled classroom setting, where the researcher provides instructions and monitors for any questions or difficulties.

MIND Intervention: Over one academic quarter, learners participate in MIND instruction sessions held every Friday, totaling 12 sessions. The MIND approach is broken down into weekly activities:

Week 1: Multimedia - Learners watch captioned video stories to enhance comprehension through visual and contextual cues.

Week 2: i-learning - Learners engage in gamified reading comprehension exercises that reinforce critical thinking and connect to the stories viewed in Week 1.

Week 3: Navigable Activities - Learners independently create visual outputs, such as posters or infographics, using Canva to reinforce comprehension and creativity.

Week 4: Presentation of Outputs - Learners present their outputs, providing opportunities to consolidate and reflect on their learning.

Posttest Administration: After completing the quarter-long intervention, learners will take a posttest to assess their reading comprehension. While the posttest will follow the same 20-item multiple-choice format as the pretest, it will consist of a different set of comprehension questions. This ensures that learners are not merely recalling answers from the pretest but are genuinely demonstrating improved comprehension skills. Maintaining consistency in the test structure enables reliable comparison between pretest and posttest results, ensuring that any observed significant difference is attributable to the intervention's effectiveness rather than to variations in test design.

Data analysis tool

The data gathered on the effectiveness of MIND instruction in improving the reading comprehension of Grade 4 learners were analyzed using appropriate descriptive and inferential statistical tools. The quantitative data from the pre-test and post-test results were treated using mean and standard deviation

to describe the learners' level of reading comprehension before and after the implementation of the intervention.

To determine whether there was a significant difference in learners' reading comprehension performance before and after the implementation of MIND instruction, a paired-samples t-test was employed. This statistical tool was used to test the effectiveness of MIND instruction, which integrates Multimedia, i-learning, and Navigable Delivery, in improving learners' comprehension skills.

The analysis process began with the organization and tabulation of pre-test and post-test scores. The computation of descriptive statistics followed this to summarize learner performance. Finally, an inferential analysis using the paired-samples t-test was conducted to determine the statistical significance of the difference between the two sets of scores. All computations were carefully carried out to ensure accuracy, reliability, and validity of the results in determining the effectiveness of MIND instruction.

Ethical considerations

Ethical considerations were strictly observed throughout the research process. Ethical approval for the study was obtained, and informed consent was digitally collected from all respondents. Participation in the study was entirely voluntary, with no coercion, and respondents were informed of their right to withdraw at any time without penalty or consequence. All collected data were anonymized and securely stored in encrypted systems to ensure confidentiality, in accordance with Republic Act 10173, also known as the Data Privacy Act of 2012. Respondents were not exposed to any physical, emotional, or psychological harm during the study, and particular attention was given to their well-being, especially when discussing the sensitive impacts of heightened seasonal heat.

Data presentation and analysis

This section presents findings from the pre- and post-test results of Grade 4 learners who were exposed to MIND instruction, which integrates Multimedia, i-learning, and Navigable Delivery. The data are organized and analyzed to determine the level of reading comprehension before and after the intervention, as well as the significant difference in learners' performance. The results are presented using the computed mean scores and the outcome of the paired-samples t-test, which were used to assess the effectiveness of MIND instruction in improving learners' reading comprehension skills.

The Level of reading comprehension skills of Grade 4 learners during the pretest

The two groups were evaluated before the study's implementation to determine their reading comprehension levels.

Table 1. Level of reading comprehension skills of the control and experimental groups before the intervention

Score Range	Control Group	Experimental Group
17-20	0	0
13-16	0	0

9-12	1	0
5-8	3	5
0-4	3	2
Mean	5.14	5.21
Level	Developing	Developing

Source: PHIL-IRI result (pretest) of Grade 4 Learners

Table 1 presents the pretest reading comprehension levels of the control and experimental groups. As shown, none of the learners in either group scored in the higher proficiency ranges of 17–20 (Advanced) and 13–16 (Proficient). Only one learner (14.29%) in the control group reached the 9–12 (Approaching Proficiency) range, whereas none in the experimental group did.

The majority of learners in both groups fell within the 5–8 (Developing) range, with three learners in the control group and five in the experimental group demonstrating partial, still limited, comprehension skills. Additionally, both groups had learners in the 0–4 (Beginning) category, indicating minimal comprehension: three in the control group and two in the experimental group.

The computed mean scores further support this trend. The control group obtained a mean of 5.14, while the experimental group recorded a comparable mean of 5.21. Both mean scores fall within the Developing level, suggesting that learners from both groups exhibit similar reading comprehension abilities prior to the intervention.

Table 2. Level of reading comprehension skills of the control and experimental groups after the intervention

Score Range	Control Group	Experimental Group
17-20	0	5
13-16	1	2
9-12	4	0
5-8	2	0
0-4	0	0
Mean	9.93	17.36
Level	Proficient	Advanced

Source: PHIL-IRI result (posttest) of Grade 4 Learners

Table 2 shows the level of reading comprehension skills of the control and experimental groups after the intervention. The experimental group achieved a mean score of 17.36, classified as *Advanced*, with the majority of students scoring in the highest range of 17-20, while the control group obtained a mean score of 9.93, corresponding to the *Approaching* level, with most students remaining in the 9-12 score range. This indicates that the intervention had a significant positive effect on the experimental group's reading comprehension. The use of multimedia elements provided learners with integrated visual and verbal information, enhancing understanding and retention (Mayer, 2009). Interactive learning activities actively engaged students, promoting higher-order thinking and the application of skills (Prince, 2004).

Additionally, navigable delivery instructions allowed learners to control the pace of their learning, review materials, and consolidate knowledge, which has been shown to improve comprehension outcomes (Clark & Mayer, 2016; Schunk & Greene, 2018). These findings demonstrate that combining multimedia, interactive, and learner-controlled strategies effectively supports the development of reading comprehension skills.

Table 3. Significant difference in the level of reading comprehension skills before and after the intervention (n=14)

Group	Mean	Difference	t-value	t-crit	Decision
Pretest					
Control Group	5.14				
Experimental Group	5.21	0.07	0.09	2.160	Not significant
Posttest					
Control Group	9.93				
Experimental Group	17.36	7.43	8.50	2.160	Significant

*0.05 level of significance

Source: PHIL-IRI result (pretest and posttest) of Grade 4 Learners

The results in Table 3 show that there was no significant difference in reading comprehension skills between the control (M = 5.14) and experimental (M = 5.21) groups before the intervention ($t = 0.09$, $t\text{-crit} = 2.160$, not significant), indicating that both groups started at a comparable level. After the intervention, the experimental group (M = 17.36) significantly outperformed the control group (M = 9.93) with a mean difference of 7.43 ($t = 8.50$, $t\text{-crit} = 2.160$, significant). This suggests that the intervention had a positive and significant effect on the experimental group's reading comprehension skills.

Results and discussion

The findings of the study reveal that the implementation of MIND (Multimedia, i-learning, Navigable Delivery) instruction significantly improved the reading comprehension skills of Grade 4 learners, as evidenced by the substantial increase in the experimental group's mean score from 5.21 (Developing) in the pretest to 17.36 (Advanced) in the posttest, compared to the control group's more modest improvement from 5.14 to 9.93. The absence of a significant difference between the two groups prior to the intervention confirms that both groups started at a comparable level, thereby strengthening the validity of the results. The marked improvement in the experimental group can be attributed to the integration of multimedia elements, interactive learning tasks, and learner-controlled navigation, which collectively enhanced engagement and supported deeper text processing.

This finding is consistent with Mayer's Cognitive Theory of Multimedia Learning (2001), which posits that combining visual and verbal information facilitates better understanding, as well as with studies by Robin (2008) and Prince (2004), which highlight the effectiveness of digital storytelling and active learning in improving comprehension. Furthermore, the MIND approach's emphasis on navigation promoted learner autonomy and self-paced learning, supporting the claims of Clark and Mayer (2016)

and Schunk and Greene (2018) that such strategies enhance retention and comprehension. These results also reinforce the importance of explicit comprehension instruction as emphasized by the National Reading Panel (2000) and Duke and Pearson (2002), particularly in addressing the persistent reading difficulties noted among Filipino learners (Bernardo, 2020; Mullis et al., 2017).

In terms of contribution, the study provides both theoretical and practical significance by extending multimedia learning and constructivist theories into a structured, context-based instructional model suitable for elementary learners, while also offering a viable framework that integrates cognitive, technological, and pedagogical principles. Practically, the findings support the need for policy enhancements in literacy instruction, particularly the integration of MIND-based strategies into the Language Arts and Multiliteracies Curriculum, the provision of teacher training on technology-enhanced instruction, and the allocation of resources for digital learning tools, aligning with the goals of DepEd's literacy programs, such as the 3B Program and Brigada Pagbasa. These implications highlight the importance of adopting innovative, learner-centered approaches to address the diverse needs of learners and improve overall literacy outcomes.

However, despite these contributions, the study is limited by its small sample size and its confinement to a single school context, which may affect the generalizability of the findings, as well as by the short duration of the intervention and the reliance on quantitative measures that may not fully capture learners' experiences. Consequently, future research is recommended to involve larger, more diverse samples, employ longitudinal designs to examine long-term effects, and incorporate qualitative approaches to understand learner engagement and instructional processes better. Further studies may also explore the influence of moderating variables such as motivation, teacher facilitation skills, and access to technology, and extend the application of MIND instruction to other subject areas, thereby providing a more comprehensive evaluation of its effectiveness in improving overall academic performance.

Conclusion

This study shows that MIND instruction can make a real difference in improving Grade 4 learners' reading comprehension. The learners who experienced this approach did not just improve; they reached a much higher level of understanding than those taught using traditional methods. By combining multimedia, interactive learning, and clear, easy-to-follow materials, MIND instruction made learning more engaging and meaningful for the students.

More importantly, it helped them better understand texts at different levels, from basic ideas to deeper, more critical thinking. These results highlight how using creative, technology-supported strategies in the classroom can better support learners.

In light of these findings, teachers are encouraged to explore and adopt approaches like MIND instruction to help students become more confident and capable readers.

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