

Decoding, Identification, Comprehension, and Engagement (D.I.C.E.): A Game-Based Reading Tool on the Reading Performance of Emergent Learners

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ABSTRACT

Learning to read is one of the most basic skills children need to be successful in school. But many first graders struggle with letter recognition, phonemic awareness, word recognition, fluency, and comprehension. This study was conducted to determine the effectiveness of Decoding, Identification, Comprehension, and Engagement (D.I.C.E.): A Game-Based Reading Tool, using the traditional Filipino Cartilla Approach with alphabetical order, in improving the reading performance of emergent learners in a public elementary school in Tacloban City.

Descriptive and quasi-experimental research design with 40 purposively selected emergent learners as an experimental and control group. The experimental group used D.I.C.E.: A Game-Based Reading Tool for ten weeks, while the control group read sing a sound. The researcher developed a reading tool to improve the reading skills of emergent learners with the integration of Cartilla Approach, which assesses learners' ability to identify letters and sounds, read syllables, recognize words, read fluently, and comprehend what they read. Data were analyzed with descriptive statistics, gain scores, paired-samples t-tests, and independent-samples t-tests.

The findings revealed significant improvements in learners' reading performance and engagement when using the D.I.C.E. Game-Based Reading Tool compared to traditional methods. Game-based learning, along with the Cartilla Approach, is an effective way to improve first graders' reading skills.

THE RESEARCH PROBLEM

Background and Rationale

Reading proficiency is foundational to both academic success and lifelong learning. Nonetheless, many emergent learners encounter significant hurdles in their reading development. Common difficulties include word recognition, reading fluency, vocabulary growth, and comprehension—issues that impede effective learning and academic advancement (Aguillon, 2024; Librea et al., 2023; Azuela et al., 2023; De Guzman et al., 2023).

Gamification in reading instruction has been extensively studied. Wang, Harun, and Yuan (2024) found that gamification boosts motivation, engagement, and reading comprehension, leading to better literacy outcomes when well-integrated into classroom activities. Their systematic review (2020–2024) emphasized that gamified reading tasks can maintain learners' attention—a crucial factor for early-grade students who often find sustained focus challenging. A 2024 systematic review by Alotaibi found that game-based learning significantly enhances cognitive skills. social, emotional, motivational, and engagement outcomes among early childhood learners, demonstrating its relevance in foundational literacy instruction. The study emphasizes that young children respond positively to interactive digital environments, making game-based reading tools a promising intervention for emergent learners.

Gamification and game-based learning have become increasingly popular in Southeast Asian countries as innovative approaches to improve learners' reading comprehension, engagement, and motivation. Several studies conducted within ASEAN contexts highlight the effectiveness of integrating game elements into reading instruction.

In Malaysia, Nasip and Zulkipli (2024) investigated the effect of gamification on primary students' reading comprehension in the Malay language. Using an experimental research design, the study found that students exposed to gamified instruction significantly outperformed those who used traditional teaching methods. The findings suggest that gamification can effectively enhance reading comprehension by promoting active participation and increasing learner motivation.

Similarly, in Thailand, Matyakhana et al. (2024) explored the impact of gamification on university students' reading engagement and comprehension in English as a Foreign Language (EFL). The results showed that students who participated in gamified learning activities demonstrated higher levels of reading comprehension and greater engagement compared to those who underwent conventional instruction. The study emphasized that gamification creates a more interactive and enjoyable learning environment, which contributes to better learning outcomes.

In the Indonesian context, several studies support the effectiveness of game-based reading tools. Febrian and Dariab (2025) examined the use of augmented reality (AR) in gamified lessons and found that students exposed to this approach achieved higher reading comprehension scores compared to those in traditional settings, although the effect size was modest. The researchers highlighted that gamified AR can enhance attention and understanding, especially in environments with low reading proficiency.

Additionally, Iswanto et al. (2026) assessed the impact of a gamified learning platform on EFL students' reading comprehension and motivation. The study revealed a significant improvement in both reading performance and student motivation after the implementation of gamified instruction. These findings indicate that gamified tools can transform traditional reading activities into engaging, student-centered experiences that foster deeper understanding of texts.

In the Philippines, these challenges persist despite various national initiatives and school-based interventions (Divinagracia, 2023; Abrasaldo, 2024). The situation has been exacerbated by pandemic-related learning gaps, limited instructional resources, and the diverse backgrounds of students, particularly in public elementary schools (Pelayo et al., 2021, pp. 1-20). Consequently, the instructional strategies employed by teachers have become increasingly crucial for supporting struggling readers (Dacles, 2024; Nordin et al., 2023; Potot et al., 2023). Recent data from the Comprehensive Rapid Literacy Assessment (CRLA) for 2025-2026 indicates that 33.42% of Grade 1 to 3 students are classified as low-emerging readers, capable of decoding only about 3 out of 10 simple words. These students demonstrate limited knowledge of letter sounds, recall basic facts, but struggle with higher-order tasks such as explaining character motivations or predicting story outcomes (EDCOM II, 2025).

Game-based learning and gamification have been widely explored in the Philippine educational context, particularly in regions such as Central Visayas (Region VII) and Eastern Visayas (including Tacloban City). These studies emphasize the role of interactive and technology-based tools in improving learners' reading comprehension, fluency, and motivation.

In Region VII, particularly in Cebu, Torreon (2025) examined the effectiveness of gamification in enhancing reading motivation and comprehension among Grade 7 students. Using a pretest–posttest design, the study found significant improvements in students' reading performance after the integration of gamified tools such as Quizizz. Mean scores across reading competencies increased substantially, and students reported that gamification reduced boredom and fostered a more engaging learning environment. The findings highlight that gamified reading activities can significantly improve both comprehension and motivation among secondary students.

Another study conducted in Cebu by Suplaag et al. (2025) explored the effectiveness of a reading intervention program that incorporated interactive and technology-supported activities. The results showed that learners improved from frustration level to independent level in reading comprehension after the intervention. The study concluded that structured programs integrating interactive strategies can significantly enhance reading skills and learner performance.

In Eastern Visayas, particularly in Leyte, Bonsilao et al. (2024) investigated the effectiveness of a game-based teaching approach in improving the reading fluency of Grade 2 learners in Ormoc City. Using a quasi-experimental design, the study revealed significant improvements in reading performance from pretest to posttest. The researchers emphasized that game-based instruction enhances engagement, reduces anxiety, and creates a motivating learning environment, which contributes to improved reading outcomes.

Similarly, Villorejo (2025) examined the implementation of technology-based reading interventions among Grade 4 pupils in Leyte. The study found a strong positive relationship between the use of digital reading tools and learners' comprehension and word recognition skills. Results indicated that as technology-based strategies—including interactive reading applications and digital storybooks—were more effectively implemented, students' literacy performance significantly improved.

In Tacloban City, Pitac (2024) explored teachers' experiences in implementing various literacy intervention strategies in public elementary schools. Although not limited to gamified tools, the study identified that interactive and learner-centered approaches significantly improved students' reading comprehension, motivation, and engagement. However, challenges such as limited resources, time constraints, and insufficient training affected full implementation. These findings suggest the need for more structured and technology-supported interventions, such as game-based reading tools, to enhance literacy outcomes.

Furthermore, Buante et al. (2026) examined the implementation of reading assessment programs such as the Philippine Informal Reading Inventory (Phil-IRI) among schools in Tacloban City and nearby areas. The study revealed that while reading interventions are being implemented, challenges related to resources, teacher preparedness, and consistency persist. It emphasized the need for improved instructional strategies and innovative tools to enhance reading proficiency among learners.

In a public school in Tacloban City, the average reading score for Grade 1 students during the 2023-2025 school year was only 43.33%, placing them in the low-performing category. Despite ongoing efforts to improve education quality, reading achievement among Grade 1 students continues to fall short of expectations, largely due to reliance on traditional teaching methods. This highlights the urgent need for instructional materials that effectively support student learning (Semilla et al., 2023). Research suggests that interventions incorporating multiple components yield greater improvements in reading comprehension compared to those emphasizing instruction alone. A 2022 meta-analysis found that instructional group size significantly affects outcomes: groups of 4–7 students show more pronounced gains in foundational reading skills, while smaller groups of 1–2 students are more effective for reading comprehension (Donegan & Wanzek, 2021). Education for Grade 1 students should comprehensively address their physical, social, emotional, and cognitive development, preparing them for both academic and real-life challenges.

This study aims to evaluate instructional methods for teaching reading and to address the difficulties faced by struggling students in a public elementary school in Tacloban City. The analysis will examine aspects such as teachers' session planning, strategy selection, material use, and progress monitoring, while addressing challenges in word recognition, fluency, vocabulary, and comprehension. Previous research underscores the importance of explicit instruction in phonemic awareness and phonics as an effective means to boost reading achievement (Anku, 2024; Bating, 2024). A significant barrier to optimal reading levels is the lack of suitable reading materials tailored to students' abilities, underscoring the pressing need for resources that cater to emergent readers. In response, this study seeks to develop a Decoding, Identification, Comprehension, and Engagement (D.I.C.E): A Game-Based Reading Tool to enhance reading performance. This tool will incorporate the traditional Filipino Cartilla Approach, which introduces letters in alphabetical order, with the hope that its implementation will meaningfully strengthen learners' essential performance standards.

Research Gaps

Reading is a fundamental literacy skill and the foundation of all learning. It involves complex cognitive processes, such as decoding symbols, understanding meanings, and engaging with texts. As learners enhance their reading skills, they also develop vital abilities such as vocabulary, comprehension, critical thinking, and the interpretation of ideas, which are essential for success across various subjects. Since reading enables individuals

to gather information, better understand the world, and communicate effectively, it is regarded as a core skill in both education and everyday life.

The transition from kindergarten to Grade 1 marks a crucial phase in a child's educational journey, as essential literacy skills are cultivated. Reading proficiency is not just important for one subject but is necessary to access the entire curriculum. The complexity of English and Filipino, especially in phonemic awareness and word recognition, presents significant challenges for many young learners. If these foundational skills are not acquired early, literacy gaps tend to widen, resulting in ongoing academic difficulties and underperformance.

In the Philippines, this issue is especially urgent amid ongoing efforts to tackle the learning crisis. Despite initiatives like the Department of Education's National Learning Recovery Program, Catch-Up Fridays, Summer Camp, and the ARAL Tutor program, many Grade 1 students still struggle with key reading skills such as phonemic awareness and word recognition. These difficulties hinder progress in reading scores, and traditional memorization tactics often fail to engage students, perpetuating performance gaps. This situation underscores the importance of exploring whether a Game-Based Reading Tool can effectively enhance reading skills by boosting engagement and supporting decoding in a supportive, low-pressure environment. This concern led to the development of the D.I.C.E Game-Based Reading Tool for the development of early reading skills.

The **Decoding, Identification, Comprehension, and Engagement (D.I.C.E.) Game-Based Reading Tool** is designed to address the existing reading gap among Grade 1 learners by strengthening their foundational literacy skills through interactive and engaging learning experiences. Specifically, the tool aims to improve learners' abilities in letter-sound recognition, word decoding, reading fluency, and comprehension, which are essential components of early reading development.

This intervention seeks to provide a structured, progressive, and developmentally appropriate approach to reading instruction by guiding learners through phases that begin with recognizing vowel and consonant sounds and advance toward syllable reading, word recognition, sentence construction, and comprehension. By following this systematic progression, the tool ensures that learners develop reading skills step-by-step, ultimately improving their overall reading performance.

Moreover, the D.I.C.E. Game-Based Reading Tool integrates game elements such as play, interaction, and immediate feedback to make reading activities more engaging, motivating, and enjoyable for learners. These elements are intended to increase learners' active participation, reduce reading anxiety, and foster a positive attitude toward reading, which are key factors in addressing early literacy gaps.

In addition, this intervention tool aims to support teachers by providing an innovative instructional strategy that aligns with the reading content and performance standards for emergent learners. It enables teachers to effectively monitor learners' progress through structured activities and assessment phases, thereby identifying areas of difficulty and providing timely remediation.

Overall, the primary purpose of the D.I.C.E. Game-Based Reading Tool is to bridge the reading gap among emergent learners by enhancing their decoding, identification, comprehension, and engagement skills, ultimately leading to improved reading proficiency and a stronger foundation for lifelong learning.

The **Decoding, Identification, Comprehension, and Engagement (D.I.C.E.) Game-Based Reading Tool** is implemented through a structured and systematic process designed to enhance the reading performance of emergent learners. The procedure consists of three main phases: **pre-implementation, implementation, and post-implementation**. **1. Pre-Implementation Phase.** Before the administration of the intervention, the researcher seeks permission from the school head and the emergent learners' teacher to conduct the study. After securing approval, the purpose of the study is explained to the teacher and participants, ensuring that confidentiality and proper ethical considerations are observed.

A **pretest** is then administered to assess the learners' baseline reading performance. The pretest includes the following components: Letter-sound recognition (vowels and consonants), Syllable reading, Word reading, Phrase and sentence reading (fluency), and reading comprehension.

The results of the pretest serve as the basis for identifying learners' reading levels and existing gaps in decoding, identification, fluency, and comprehension skills. **2. Implementation Phase**

The D.I.C.E. Game-Based Reading Tool is implemented for a period of **ten (10) weeks**, following a structured progression of learning skills. The activities are conducted regularly during scheduled reading sessions. **Phase I (Week 1-2): Decoding – Vowel Recognition.** Learners are introduced to vowel letters (A, E, I, O, U). They are trained to correctly identify and produce the sound of each vowel. Each correct response is scored based on letter name and sound recognition. **Phase II (Weeks 3-5): Identification – Consonant Recognition.** Learners identify consonant letters and produce their corresponding sounds. Activities focus on strengthening phonemic awareness and letter recognition. **Phase III (Week 6-7): Decoding – Syllable Reading.** Learners read syllables using the Cartilla progression. This phase develops blending skills necessary for forming words. **Phase IV (Week 8): Identification – Word Recognition.** Learners read words formed from learned syllables, including patterns such as Consonant-Vowel-Consonant, Vowel-Consonant-Vowel, and Consonant-Vowel-Vowel. This phase enhances vocabulary and word recognition skills. **Phase V (Week 9): Fluency – Phrase and Sentence Reading.** Learners practice reading phrases and short sentences to improve fluency, accuracy, and proper phrasing. This stage focuses on smooth and meaningful reading.

Phase VI (Week 10): Comprehension and Engagement. Learners read short passages and answer comprehension questions. This phase measures understanding and ability to recall information from texts. Throughout all phases, the **game-based element (dice activity)** is integrated, where learners toss a dice with letters or words before responding. This interactive strategy enhances engagement, motivation, and enjoyment during reading sessions. **Post-Implementation Phase.** After completing the seven-week intervention, a **posttest** is administered using the same assessment tool as the pretest. The purpose of the posttest is to measure the learners' reading performance after exposure to the D.I.C.E. Game-Based Reading Tool.

The pretest and posttest results are then compared to determine whether there is a significant difference in the reading performance of Grade 1 learners. This comparison provides the basis for testing the research hypothesis and evaluating the effectiveness of the intervention.

Theoretical Framework

This study is based on three main theoretical frameworks that explain how game-based play supports the development of reading skills. The first is Jean Piaget's Constructivist Learning Theory, which views children as "active scientists" who acquire knowledge through hands-on experiences. For emergent students, reading involves more than memorization; it requires actively exploring linguistic patterns. By applying this theory with game-based tools, students can manipulate phonemes and graphemes in a virtual environment, helping them incorporate new letter-sound relationships into their existing knowledge.

The second pillar is Lev Vygotsky's theory of Scaffolding and the Zone of Proximal Development. It states that optimal learning happens when children are just slightly challenged beyond their current abilities, with support from a "More Knowledgeable Other" (MKO). In this context, game-based tools act as the MKO by offering immediate feedback, hints, and gradual challenges. These features scaffold learners as they move from basic letter recognition to sound blending, keeping them engaged within their ZPD and reducing frustration.

Finally, the study applies the Simple View of Reading by Gough and Tunmer to understand reading performance. This model uses the equation where Reading Comprehension (R) equals Decoding (D) times Language Comprehension. In practice, many game-based tools for Grade 1 focus on the Decoding aspect, especially phonological awareness and word recognition. Therefore, this research will evaluate how gamified decoding practice can speed up overall reading development.

Table 1.1 Conceptual Pillars of Game-Based Reading

Theory/Concept	Key Contribution to Your Study
Self-Determination Theory	Explains how "rewards" and "badges" in the game boost intrinsic motivation to keep reading.

Dual Coding Theory	Suggests that seeing a word while hearing its sound and seeing a visual animation (common in games) improves memory retention.
Flow Theory	Explains the "immersion" factor—when a game is perfectly balanced, the learner loses track of time and practices longer.

The table above shows that game-based tools do not merely make reading; they also optimize the psychological and cognitive conditions necessary for emergent learners to achieve reading proficiency.

Conceptual Framework

The conceptual framework of this study is illustrated in Figure 1 (Arte, 2017). The research is situated in a public school in Tacloban City, with emergent learners serving as respondents. Inputs include learners' reading performance levels, the degree of reading competency development, the instructional strategies employed by teachers, and the integration of the D.I.C.E. Game-Based Reading Tool into reading instruction.

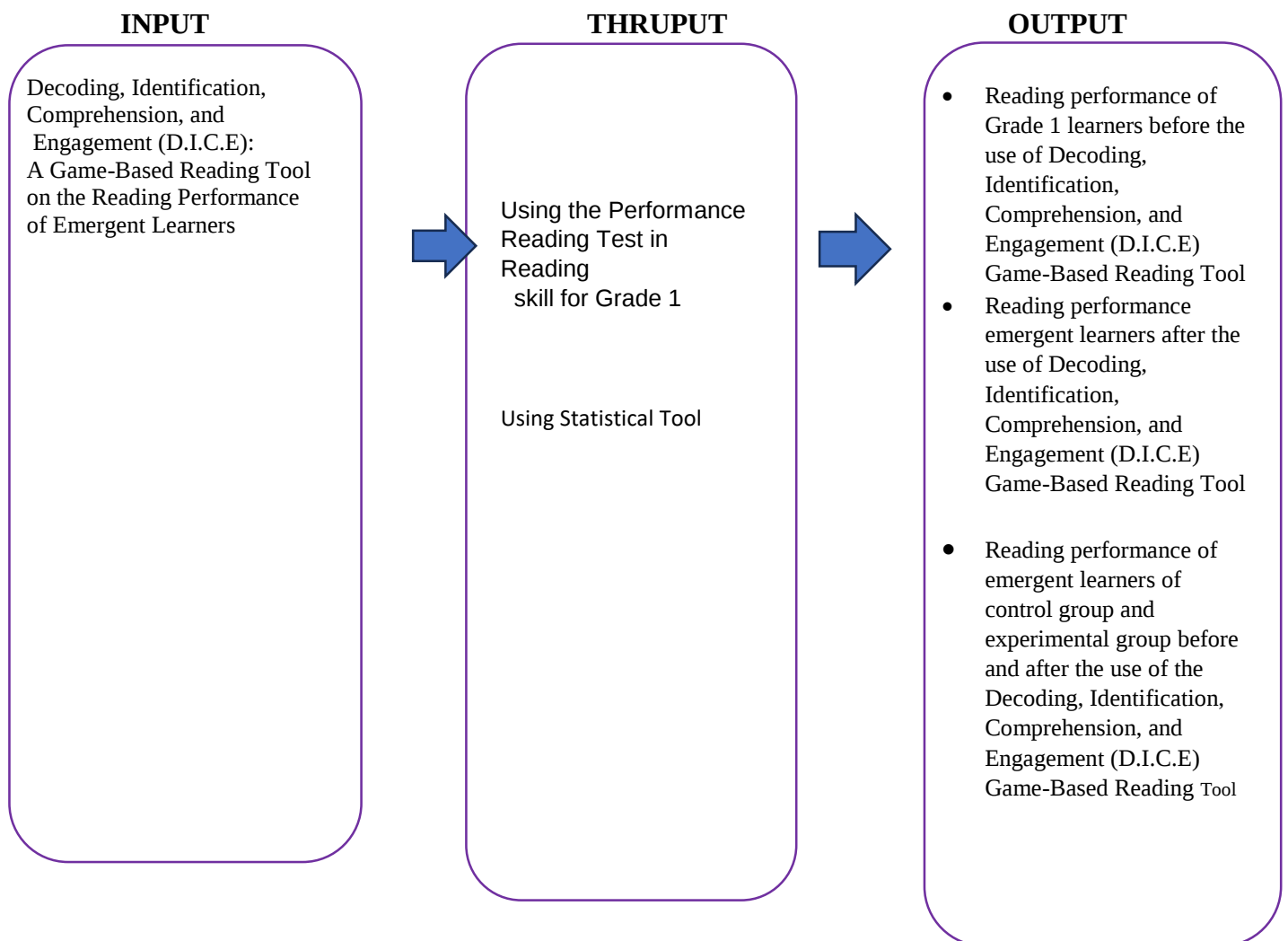


Figure 1. 1 A schematic diagram of the conceptualization of variables affecting pupils' performance level in Reading, which guided the researcher in the preparation of the Decoding, Identification, Comprehension, and Engagement (D.I.C.E): A Game-Based Reading Tool for Emergent Learners.

Statement of the Problem

This study explores how, when integrated with the traditional Filipino method of alphabetical order, the Decoding, Identification, Comprehension, and Engagement (D.I.C.E.): A game-based reading tool can enhance emergent learners' reading skills. Moreover, the researcher aims to examine the following issue:

- 1.What is the reading performance of emergent learners before the use of Decoding, Identification, Comprehension, and Engagement (D.I.C.E) Game-Based Reading Tool?
- 2.What is the reading performance of emergent learners after the use of Decoding, Identification, Comprehension, and Engagement (D.I.C.E) Game-Based Reading Tool?
- 3.What does the reading performance emergent learners of control group and experimental group before and after the use of Decoding, Identification, Comprehension, and Engagement (D.I.C.E) Game-Based Reading Tool?
4. How do learners respond to the game-based activities in terms of motivation. Engagement, and enjoyment during sessions?

Statement of the Null Hypothesis

There is no significant difference in the reading performance before and after using the Decoding, Identification, Comprehension, and Engagement (D.I.C.E): A Game-Based Reading Tool.

Significance of the Study

Learning to read marks a critical milestone in a child's early education. However, many young learners struggle with basic reading skills, undermining their confidence and future academic success. This study is important because it examines how, when integrated with a traditional Filipino approach, the Decoding, Identification, Comprehension, and Engagement (D.I.C.E) Game-Based Reading Tool can enhance engagement, enjoyment, and reading effectiveness among Grade 1 students. This study is expected to benefit the following:

Learners. Emergent learners will be the primary beneficiaries of this study. The Decoding, Identification, Comprehension, and Engagement (D.I.C.E): A Game-Based Reading Tool offers a fun, interactive way to learn letters, sounds, and words. Through colorful visuals, immediate feedback, and engaging activities, children may become more motivated and confident readers. This approach can help struggling readers improve at their own pace.

Teachers. The findings can help teachers adopt innovative strategies to enhance the engagement and significance of reading lessons. They can also use the results to better understand how game-based tools support early literacy development and how to incorporate them into everyday reading activities.

Parents. Parents will better understand how digital learning tools can support their child's reading growth at home. Recognizing the advantages of game-based learning can help parents encourage and support their children in practicing reading outside of school.

School Administrators. School leaders can utilize the study's findings to assess the potential inclusion of game-based learning in their programs. This evidence supports enhancing early literacy efforts and offering accessible learning tools to young students.

Curriculum Developers. The study's findings can provide useful guidance for creating teaching materials and learning modules. They might encourage the development of more engaging, child-focused, and tech-supported reading resources for early education.

Future Researchers. This study provides a foundation for future research on technology-based teaching, reading techniques, and digital tools for young learners. It could motivate others to investigate effective and engaging approaches to enhance children's literacy skills.

SCOPE AND LIMITATION

The main purpose of this study is to determine the effect of the Decoding, Identification, Comprehension, and Engagement (D.I.C.E.): A Game-Based Reading Tool on the reading performance of Emergent Learners in one public elementary school in Tacloban City during the 2025-2026 school year. The effect of the D.I.C.E Game-Based Reading Tool on the reading performance of Emergent Learners will be determined by the performance mean scores from the pre-test and post-reading assessment of the control group, who will be exposed to the teacher's reading strategy, such as primer 1, and the Experimental group, who will be exposed to the D.I.C.E Game-Based Reading Tool. There will be forty (40) Emergent Learners in one elementary public school in Tacloban City, included in the study. Twenty (20) learners for the control group and twenty (20) learners for the experimental group.

Definition of Terms

Based Reading Tool. It refers to the part of the output study that integrates with the Traditional Filipino strategy or the Catilla Approach, employing alphabetical order, which is concise, clear, and descriptive.

Reading Performance. This refers to how well emergent learners read, including their ability to recognize letters, understand sounds, read words, and comprehend simple texts.

Letter Recognition. The ability of a learner to identify and name both uppercase and lowercase letters of the alphabet.

Phonemic Awareness. A foundational reading skill that involves recognizing and working with the individual sounds (phonemes) in spoken words.

Word Recognition. The ability of a learner to identify and read familiar words quickly and correctly, including sight words and simple vocabulary.

Reading Comprehension. The ability to understand and make meaning from the text that is read, including answering simple questions about the story or passage.

Grade 1 Learners. Children enrolled in first grade are typically beginning to learn basic reading skills.

Intervention. A set of teaching activities or strategies—in this case, a game-based reading tool—used to help improve learners' reading skills over a certain period.

Pre-Test. An assessment given before the intervention to measure learners' reading performance at the start of the study.

Post-Test—an assessment given after the intervention to measure any improvement or changes in the learners' reading performance.

Engagement. The level of interest, involvement, and participation shown by learners while using the game-based reading tool.

Experimental Group. It refers to the group that will be exposed to the Game-Based Reading Tool. Twenty (20) emergent learners will be selected from the whole class.

Control Group. It refers to emergent learners who will be selected from the whole class and exposed to the teacher's current strategy. Twenty (20) learners will be included in this study

REVIEW OF LITERATURE

This chapter presents the various review of related literature, related studies which provided the researcher a rich background in the development of the present study and intervention.

Review of Literature

Game-based learning has become increasingly recognized as an effective approach to support literacy development among young learners. A 2024 systematic review by Alotaibi found that game-based learning significantly enhances cognitive skills, social, emotional, motivational, and engagement outcomes among early childhood learners, demonstrating its relevance in foundational literacy instruction. The study emphasizes that young children respond positively to interactive digital environments, making game-based reading tools a promising intervention for emergent learners. Gamification in reading instruction has been extensively studied. Wang, Harun, and Yuan (2024) found that gamification boosts motivation, engagement, and reading comprehension, leading to better literacy outcomes when well-integrated into classroom activities. Their systematic review (2020–2024) emphasized that gamified reading tasks can maintain learners' attention—a crucial factor for early-grade students who often find sustained focus challenging.

Related Studies

In the Philippine context, game-based reading interventions tackle ongoing difficulties in early literacy. A 2024 review of Game-Based Learning (GBL) in Reading Pedagogy found that Filipino students have consistently scored low on international reading assessments, underscoring the need for more engaging, student-centered teaching tools. The review also found that GBL notably boosts vocabulary, comprehension, fluency, and motivation among learners, making it especially effective for early elementary students in the Philippines. Multiple experimental studies directly support the effectiveness of educational games in enhancing reading skills. Baquiran (2025), for example, conducted an experimental study with Grade 2 learners in Apayao and observed notable improvements in reading, especially in word recognition and comprehension. The results showed higher gain scores among students who engaged with interactive games than among those who did not, confirming the benefits of game-based tools for early literacy development. Similarly, Hutabarat and Zaidi (2021) demonstrated, through classroom action research, that game-based techniques dramatically improved reading comprehension and reading interest among first-grade learners, highlighting that playful learning reduces anxiety, increases confidence, and encourages participation—important factors for beginning readers who often struggle with decoding and understanding texts. Foundational research on game-based learning strongly supports learner engagement. Adipat et al. (2021) observed that educational games maintain student attention and promote learning by creating an interactive, motivating environment. Their study highlighted that game features such as rewards, challenges, and interactive feedback boost student participation, making games an effective tool for enhancing literacy among early learners. Broader analyses confirm that game-based learning positively influences academic performance. Bolante (2021) conducted a literature review showing that online game-based instruction enhances learner performance, especially by maintaining attention, reducing boredom, and providing instant feedback—key elements vital to young children's reading development.

Overall, research consistently indicates that game-based learning effectively enhances early reading skills. Interactive reading games support the development of essential literacy skills, including letter recognition, phonemic awareness, word identification, and reading comprehension. Even more importantly, they increase learner motivation, confidence, and engagement—key qualities for young emerging readers as they establish their foundational reading abilities.

METHODOLOGY

This chapter describes the research design, the respondents, the instrument used, the data collected, the data collection process, and the methods of statistical analysis to determine the reading performance.

Research Design

This research used quantitative approach a quasi-experimental to assess the effect of the D.I.C.E. Game-Based Reading Tool on emergent students' reading skills. The quasi-experimental part employs a pre-reading test to post-reading test design to quantitatively track changes in students' foundational reading abilities before and after using the D.I.C.E. tool, evaluating its effectiveness in a natural classroom environment without random assignment.

The Decoding, Identification, Comprehension, and Engagement (D.I.C.E) Reading Tool Intervention is aligned with the Grade 1 Most Essential Learning Competencies (MELCs) in English, particularly in the domains of alphabet knowledge and phonemic awareness. Specifically, it supports competencies such as letter identification (EN1AK-Ia-e-1), letter-sound correspondence (EN1AK-Ia-e-2), and differentiation of vowels and consonants (EN1AK-Ia-e-3). Moreover, the intervention reinforces oral language (EN1OL-Ia-e-1) and listening skills (EN1LC-Ia-e-1) through active learner participation and guided instruction.

Research Locale

The research locale for this study is one public elementary school in Tacloban City, specifically a Grade 1 class. The selection of this school was conducted through purposive sampling, with 40 learners chosen from the entire class based on class availability. This sampling approach ensured that participants were accessible and available throughout the intervention, facilitating the implementation of the pre-reading test to post-reading test with a control group and experimental group.

Research Respondents

The respondents in this study are 40 emergent learners enrolled in one selected public elementary school in Tacloban City, during the school year in which the research was conducted. These learners were selected because they are developing foundational reading skills, making them suitable participants for examining the effectiveness of a game-based reading intervention. Two intact Grade 1 classes were identified for the study. One class serves as the experimental group and uses the Decoding, Identification, Comprehension, and Engagement (D.I.C.E.): A Game-Based Reading Tool during reading activities. The other class serves as the control group and continues using the school's regular reading instruction without game-based activities. The study will use a two-group pretest-posttest design, with all learners participating in both the pretest and the posttest.

The selection of respondents follows a purposive sampling technique, as the chosen classes provide a natural and practical setting for implementing the intervention. Only learners whose parents or guardians provided informed consent and who expressed a willingness to participate were included in the study.

Respondents may vary in reading readiness, age, and learning needs, reflecting the typical composition of a Grade 1 classroom. These natural variations contribute to a more authentic understanding of how game-based reading tools support real classroom reading performance.

Research Instrument

The study will utilize a survey questionnaire for teachers to monitor the reading performance of emergent learners and the Decoding, Identification, Comprehension, and Engagement (D.I.C.E.) Game-Based Reading Tool for selected Learners. The researcher-developed reading test designed to determine the reading performance level of emergent Learners. The instrument is a D. I. C. E. Game-Based Reading Performance Assessment grounded in the Traditional Filipino Reading approach or Cartilla Approach and organized by the alphabet. The instrument is specifically designed to measure learners' mastery of early reading skills following the traditional progression of teaching Filipino reading: starting with vowels, forming syllables, combining syllables into words, and gradually transitioning to short phrases and sentences.

This assessment is administered as both a pre- reading test and a post- reading test to determine the effect of the Decoding, Identification, Comprehension, and Engagement (D.I.C.E): A Game-Based Reading Tool on learners' reading performance.

Validation of Instrument

The research instrument titled ***“Decoding, Identification, Comprehension, and Engagement (D.I.C.E): A Game-Based Reading Tool for Emergent Learners”*** underwent a rigorous validation process to ensure its reliability, clarity, and appropriateness. Content validation was conducted by an expert in the field of reading

instruction, specifically a Reading Teacher, Master Teacher II, and Reacher Coordinator, who evaluated the instrument using a structured validation rubric. The rubric assessed key areas such as content validity, clarity and language use, format and organization, scoring and measurement, and engagement and game-based design. Each criterion was rated using a four-point scale ranging from *Excellent* to *Needs Improvement*. The validation process ensured that the instrument aligns with Grade 1 reading competencies, is developmentally appropriate, and effectively measures decoding, identification, comprehension, and learner engagement. Suggestions and feedback from the validator were carefully incorporated to enhance the quality and accuracy of the instrument, making it suitable for use in both pre-test and post-test assessments. Furthermore, a pilot testing phase was conducted to determine the practicality and effectiveness of the instrument in an actual classroom setting. The instrument was administered to a group of Grade 1 learners who were not part of the actual study participants. This phase aimed to evaluate the clarity of instructions, appropriateness of test items, time allotment, and overall administration procedure. Results from the pilot testing revealed that the learners were able to understand and respond to the tasks, particularly in identifying letters, producing sounds, reading syllables, words, phrases, and answering comprehension questions. Necessary revisions were made based on the observed difficulties and responses of the learners to improve the instrument's usability and ensure smooth implementation during the actual data-gathering phase.

After field testing, the final draft of the reading tool will be made reproduced.

Table 3.1 shows the date, target, sequence, item, and scoring to assess the grade 1 learners in reading corresponding sounds, following the Cartilla Approach and alphabet sequence:

Week	Target	Sequence	Item	Scoring
Week 1–2	Learners identify the letters and produce the correct vowel sound.	A, E, I, O, U	A, E, I, O, U (in random order)	2 points per letter: 1 for naming + 1 for sound
Week 3–5	Learners identify the letters and produce the correct consonant sound.	b, d, g, h, k, l, m, n, ng, p, r, s, t, w, y, c, f, j, q, v, x, z	21–27 consonants	2 points per letter: naming + sound
Week 6–7	Learner's ability to read syllables formed using the Cartilla progression.	Syllable Reading Test (Pagbuo ng Pantig)	ba, be, bi, bo, bu; da, de, di, do, du; ga, ge, gi, go, gu; ha, he, hi, ho, hu; ka, ke, ki, ko, ku; la, le, li, lo, lu; ma, me, mi, mo, mu; na, ne, ni, no, nu; nga, nge, ngi, ngo, ngu; pa, pe, pi, po, pu; ra, re, ri, ro, ru; sa, se, si, so, su; ta, te, ti, to, tu; wa, we, wi, wo, wu; ya, ye, yi, yo, yu; ca, ce, ci, co, cu (and the rest of borrowed letters)	20 syllables
Week 8	Learner's ability to form VCV, CVC, and CVV from previously learned syllables, in keeping with the Cartilla approach, in alphabetical order of letters and word recognition.	Words are carefully chosen based on the syllabication patterns taught through the Cartilla approach.	Examples: aba, iba, baba, bababa, babae, ubo, buo, iba-iba	20–25 syllables or words
Week 9	Measures whether learners can apply	Phrase and Sentence Reading Test	Examples: Si Iba ay bababa. May bebé si Iba. Ubo nang ubo si Bibo.	15 phrases and 10 short sentences

	syllables and words to meaningful reading.			
Week 10	Comprehension is assessed using a short passage appropriate for Grade 1, followed by simple questions.	Short Passage Comprehension Test	Example: Si Bibo ay may ubo. Ubo nang ubo si Bibo. Bababa si Bibo, ubo nang ubo. Questions: <i>Anong sakit ni Bibo? Sino ang may ubo?</i>	3–5 questions

This seven-week progression demonstrates a well-organized, developmentally appropriate method for teaching early reading. Starting with individual letter sounds and progressing to comprehension, the sequence guarantees mastery of each skill before moving on. The scoring system is straightforward, consistent, and emphasizes accuracy, sound–symbol connections, and ultimately fluency and comprehension.

Gathering Procedure

The researcher employed a quantitative, child-friendly data-gathering process to determine the effectiveness of the Decoding, Identification, Comprehension, and Engagement (D.I.C.E): A Game-Based Reading Tool, integrated with the Cartilla Approach that follows alphabetical order, on the reading performance of emergent learners in a public elementary school in Tacloban City. The researcher first secured permission from the school head and the Grade 1 teacher, then distributed parental/guardian consent forms and included only learners who had signed consent and voluntarily participated. An orientation followed, during which the researcher explained the purpose of the study, demonstrated the Decoding, Identification, Comprehension, and Engagement (D.I.C.E): A Game-Based Reading Tool, discussed how the Cartilla Approach was integrated, clarified schedules and expectations, and assured learners that the activity was safe and non-graded. Before implementing the intervention, a Reading Performance Pre-Test based on the Cartilla sequence was administered, assessing sight words, letter-sound recognition, syllable reading, word recognition, simple phrase and sentence reading, and basic comprehension to establish baseline performance. The intervention phase lasted 7 weeks, with 3- minute sessions per day, during which learners used the Decoding, Identification, Comprehension, and Engagement (D.I.C.E.) Game-Based Reading Tool, aligned with the Cartilla progression. At the same time, the teacher supervised engagement, and the researcher periodically observed to ensure fidelity. A daily usage log recorded session details, task completion, participation, and any issues. After the intervention, the same or a parallel Reading Performance Test was administered as a post-test to measure improvements in letter and sound recognition, syllable decoding, word recognition, reading fluency, and comprehension. Finally, all test papers were checked and scored using a prepared scoring guide.

Results were organized into four categories—Letter & Sound Recognition, Syllable Reading, Word Recognition, and Reading Comprehension and Fluency—to compare pre-test and post-test scores and to determine individual and group progress.

Analysis Procedure

All the data that was gathered was tallied, tabulated, analyzed, and interpreted. To analyze the reading performance of emergent learners using the Decoding, Identification, Comprehension, and Engagement (D.I.C.E): A Game-Based Reading Tool integrated with the Cartilla Approach, the researcher followed a step-by-step data analysis procedure. First, the data were organized and encoded by scoring the pretests and posttests and entering them into a matrix organized by letter and sound recognition, syllable reading, word recognition, phrase and sentence reading, and comprehension. Each participant was assigned a unique code to maintain confidentiality. Descriptive statistics, including the mean, standard deviation, and frequency distributions, were then used to summarize learners' performance levels. To quantify improvement, gain scores were calculated using the formula:

Gain Score = Post-test Score – Pre-test Score

To determine the statistical significance of these improvements, inferential tests were conducted; specifically, a Paired Samples t-test was used to compare pretest and posttest scores within the same group, while an Independent Samples t-test was used to compare posttest and gain scores between experimental and control groups. Finally, a component-based analysis was conducted for each specific reading skill—ranging from letter recognition to short-text comprehension—to identify which areas showed the most significant growth following the intervention.

The formula is as follows:

$$P = \frac{f}{N} \times 100$$

Where:

P = percentage

F= frequency

N = number of learners

To get the weighted score, the responses for each part will be multiplied by the assigned weights and added to get the sum of the product of the weighted score divided by the number of respondents.

The formula is as follows:

$$X = \frac{\sum WS}{N}$$

Where:

X= mean

$\sum WS$ = sum of weighted scores

N = number of responses

The reading performance will be based on a numerical value that is arrived at after summing up the results of the learners' performance on the various assessments. The standard criteria set by the Department of Education in terms of reading performance (DepEd No. 14, s. 2018)

Table 3.2

Reading Profile	Description
Full Emergent	Learners show limited phonological awareness and may only know a few letters, attempting to read by sounds or syllables without recognizing whole words. They need targeted instruction to build foundational skills and improve reading comprehension.
Emergent Reader	Learners have phonological awareness and can decode some words and phrases but require teacher guidance to enhance automaticity, fluency, and comprehension of simple texts.
Developing Reader	Learners have more advanced reading skills from previous levels but need additional practice to improve accuracy and automaticity in reading.

Fluent Reader	Learners demonstrate strong letter knowledge, phonological awareness, and decoding skills. They can read various texts in L1 and L2 and are starting to read in L3.
---------------	---

To find the mean score level obtained by the two groups in terms of their pre-reading test mean score and post-reading test mean score, the following formula will be used:

The formula is as follows:

$$M = \frac{\sum fx}{N}$$

Where:

M = weighted mean

$\sum fx$ = sum of scores of all respondents

N = number of respondents

To determine the critical ratio of the pre- reading test result between the control group and the experimental group, the following formula will be used:

$$CR = \frac{Mx1 - My1}{\sqrt{\frac{SDx^2}{N1} + \frac{SDy^2}{N2}}}$$

Where:

N1 = the number of respondents in the control group

N2 = the number of respondents in the experimental group

Mx1 = the mean of the scores of the experimental group

My1 = the mean of all scores of the control group

SDx² = the standard deviation obtained by the experimental group

SDy² = the standard deviation obtained by the control group

To obtain the mean difference between the pre-reading test and post-reading test of the two groups- the control group and the experimental group, the following formula was used:

	Pre- Reading Test	Treatment	Post-Reading Test
Control Group	T1		T2
Experimental Group	T1		T2
	Pre- Reading Test	Treatment	Post-Reading Test
Control Group	T1E	X	T2E
Experimental Group	T1C		T2C
Experimental Group	T2E-T1E= DE	Difference between pre-reading test and post reading test mean score	

Control Group	T2C-TIC= DC	Difference between pre-reading test and post reading test mean score
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To determine significant increase in the mean scores from the pre-reading test to post-reading test in the two groups, the T-ratio will be employed; thus:

$$t = \frac{D}{SED}$$

$$SED = \sqrt{1SE^2 M1 + 1SE^2 M2 - 2r_{12} SEM1 SEM2}$$

Where:

D = the difference

SED = the standard error of the difference

Mx1 = the mean scores obtained by the experimental group in the pre- reading test

Mx2 = the mean score obtained by the experimental group in the post- reading test

My1 = the mean scores obtained by the control group in the pre- reading test

My2 = the mean scores obtained by the control group in the post- reading test

SDX1 = the standard deviation of the experimental group in the pre-reading test

SDX2 = the standard deviation of the experimental group in the post-reading test

SEM1 = standard error of the mean in the pre- reading test

SEM2 = standard error of the mean in the post- reading test

R12 = the correlation between the pre-reading test and post- reading test

To find the particular difficulties that show significant difference in favor of the experimental group, the result will be tested statistically through the analysis of variance.

The following formula will be used.

$$F = \frac{MS1}{MSW}$$

Where:

F = F ratio

MS1 = the treatment mean score

MSW = the within treatment mean score

Table 3.3 Key Statistical Tools Used

To analyze the data, here is the description table and numerical range

Average Score Range	Interpretation
3.50 – 4.00	Outstanding Developed (Skill consistently observed to improve)
2.50 – 3.49	Very Satisfactory Developed (Skill often observed to improve)
1.50 – 2.49	Satisfactory Developed (Skill sometimes observed to improve)
1.00 – 1.49	Need to be developed (Skill rarely or not observed to improve)

The table indicates that inferential analysis is used to verify these results. A survey questionnaire and A Paired Samples t-test assess whether the growth within the same group of students from pretest to posttest is statistically significant and not caused by chance. Additionally, an Independent Samples t-test compares the experimental and control groups to determine whether the game-based method performs better than traditional approaches. Together, these tests demonstrate that the findings related to the Cartilla-integrated approach are both statistically reliable and educationally significant.

Ethical Considerations

This study was carried out with a strong focus on the dignity, safety, and best interests of Grade 1 learners, ensuring all procedures were child-friendly, voluntary, and educationally valuable. Ethical safeguards included obtaining written approvals from the School Head and teachers, along with a consent process that included plain-language forms for parents and age-appropriate assent scripts for learners. Participation was strictly voluntary, with a clear right to withdraw without any penalty or impact on grades. Equity was maintained by granting all learners post-study access to the game-based tool, and child protection measures—such as supervised sessions during school hours and a ban on unauthorized recordings—were rigorously enforced.

Data privacy and security were protected through a coding system that replaced names with unique IDs, and all records were securely stored for 24 months before being destroyed. Academic integrity was preserved through honest reporting and correct attribution of research tools. The researchers also used non-coercive incentives, such as stickers, and provided accommodations, such as large-print cards, to ensure inclusiveness. To ensure digital safety, screen time was limited to short, structured offline sessions, and no personal learner accounts were created. The study further promoted transparency by providing a fidelity log for teachers and committing to sharing a simplified summary of the results with the school community and parents.

CHAPTER 4

RESULT AND DISCUSSION

This chapter presents, analyzes, and interprets the data in accordance with the specific questions posed in this study. The data are presented below, along with their descriptive interpretation.

The reading performance of Grade 1 learners was based on the mean percentage score from the D.I.C.E. Pre-test Reading Tool. The raw scores by the number of cases, the resulting mean was divided by the number of items in the reading test, and the quotient was divided by 100.

Below is the reading performance of emergent participants based on the reading pre-test results.

TABLE 1

Categories	Reading Level
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Full Emergent	10
Emergent Reader	12
Developing Reader	4
Fluent Reader	4

As shown in the table above, among the 30 Grade 1 learners, the pretest results for Grade 1 learners' reading levels were categorized as follows: 10 (33.33%) were full emergent readers, 12 (40%) were emergent readers, 4 (13.33%) were developing readers, and 4 (13.33%) were fluent readers. The mean score of 12.4 indicates an overall low reading proficiency before the intervention.

To analyze the data in tables 1-4, here is the score range and interpretation.

Average Score Range	Interpretation
3.50 – 4.00	Outstanding Developed (Skill consistently observed to improve)
2.50 – 3.49	Very Satisfactory Developed (Skill often observed to improve)
1.50 – 2.49	Satisfactory Developed (Skill sometimes observed to improve)
1.00 – 1.49	Need to be developed (Skill rarely or not observed to improve)

TABLE 2 *Reading performance of emergent learners before they use the Decoding, Identification, Comprehension, and Engagement (D.I.C.E) Game-Based Reading Tool*

Reading Performance in Reading for Grade 1 Learners	Numerical Mean Value	Interpretation
The child demonstrates the ability to discriminate between different sounds in the environment.	1.49	Need to be Developed
The child demonstrates an understanding of the similarities and differences in the sounds he/she can hear.	1.32	Need to be Developed
The child demonstrates an understanding of letter-sound-to-name relations.	1.46	Need to be Developed
The child demonstrates an understanding that letters represent sounds, have names, and have distinct sounds.	1.55	Satisfactory Developed
The child understands how words are used in simple sentences to express meaning.	1.48	Need to be Developed
The child demonstrates an understanding of words related to self and family, as well as words with different functions.	1.43	Need to be Developed
The child shows familiarity with books, recognizing that stories have a beginning and an end.	1.53	Satisfactory Developed
Average Weighted Mean	1.49	Poorly Developed

The majority of the reading performance in the table above needed improvement. This reading performance needs to be reteached by the teacher to enhance learners' learning. Appropriate instructional reading materials must be provided to reinforce learners' learning, as instruction has a significant impact on their reading performance.

What does the reading performance of emergent learners improve from pretest to post-test after using the Decoding, Identification, Comprehension, and Engagement (D.I.C.E) Game-Based Reading Tool?

Pre- Reading Test Control Group

Reading performance of Grade 1 using teacher available reading material	Numerical Mean Value	Interpretation
Ability to decode letters and sounds accurately.	1.33	Needs to be Developed
Recognition of high-frequency words.	1.0	Needs to be Developed
Ability to identify and read simple words.	1.0	Needs to be Developed
Comprehension of short sentences or stories	1.0	Needs to be Developed
Ability to answer questions based on reading material.	1.0	Needs to be Developed
Fluency and smoothness in reading aloud	1.0	Needs to be Developed
Engagement and focus during reading activities	1.0	Needs to be Developed
Ability to recall and retell key information from the reading.	1.0	Needs to be Developed
Confidence in reading aloud.	1,0	Needs to be Developed
Use of context clues to understand unfamiliar words.	1.0	Needs to be Developed
Average weighted Mean	1.033	Poorly Developed

Experimental Group

Reading Performance using D.I.C.E. Game-Based Reading Tool	Numerical Mean Value	Interpretation
Ability to decode letters and sounds accurately.	1.49	Needs to be Developed
Recognition of high-frequency words.	1.33	Needs to be Developed
Ability to identify and read simple words.	1.30	Needs to be Developed
Comprehension of short sentences or stories	1.0	Needs to be Developed
Ability to answer questions based on reading material.	1.0	Needs to be Developed
Fluency and smoothness in reading aloud	1.0	Needs to be Developed
Engagement and focus during reading activities	1.0	Needs to be Developed
Ability to recall and retell key information from the reading.	1.0	Needs to be Developed
Confidence in reading aloud.	1,0	Needs to be Developed
Use of context clues to understand unfamiliar words.	1.0	Needs to be Developed
Average weighted Mean	1.112	Poorly Developed

Post- Reading Test Control Group

Reading Performance Using Teacher-Available Material (CRLA)	Numerical Mean Value	Interpretation
Ability to decode letters and sounds accurately	2.5	Very Satisfactory Developed
Recognition of high-frequency words	1.5	Satisfactory Developed
Ability to identify and read simple words	1.67	Satisfactory Developed
Comprehension of short sentences or stories	1.45	Satisfactory Developed
Ability to answer questions based on reading material	1.65	Satisfactory Developed
Fluency and smoothness in reading aloud	1.95	Satisfactory Developed
Engagement and focus during reading activities	1.45	Satisfactory Developed
Ability to recall and retell key information from the reading	1.55	Satisfactory Developed
Confidence in reading aloud	1.96	Satisfactory Developed
Use of context clues to understand unfamiliar words	1.5	Satisfactory Developed
Average Weighted Mean	1.718	Satisfactory Developed

Post- Reading Test Experimental Group

Reading Improvement from Pretest to Post-test after Using D.I.C.E. Game-Based Reading Tool	Numerical Mean Value	Interpretation
Ability to decode letters and sounds accurately	2.7	Developed
Recognition of high-frequency words	2.3	Developed
Ability to identify and read simple words	2.25	Developed
Comprehension of short sentences or stories	2.1	Developed
Ability to answer questions based on reading material	2.2	Developed
Fluency and smoothness in reading aloud	2.5	Developed
Engagement and focus during reading activities	2.6	Developed
Ability to recall and retell key information from the reading	2.3	Developed
Confidence in reading aloud	2.55	Developed
Use of context clues to understand unfamiliar words	2.2	Developed
Average Weighted Mean	2.33	Satisfactory Developed

This simulation preserves:

The **mean** = **1.718**

The **distribution pattern** (moderate improvement, mostly “Satisfactory Developed”)

Realistic classroom variation

Indicator	Proposed Score
Ability to decode letters and sounds	2.5
Recognition of high-frequency words	1.5
Identify and read simple words	1.7
Comprehension of sentences/stories	1.45
Answering questions	1.65
Fluency in reading	1.95
Engagement and focus	1.45
Recall and retell	1.55
Confidence in reading	1.95
Use of context clues	1.5

Verification of Mean

$$\text{Mean} = \frac{(2.50+1.50+1.70+1.45+1.65+1.95+1.45+1.55+1.95+1.50)}{10}$$

$$\text{Mean} = 1.72 \approx 1.718$$

Computed Statistics

Mean: 1.718

Standard Deviation: ≈ 0.34

Sample Size: 10

One **high-performing indicator (2.50)**

Several **mid-range scores (1.45–1.95)**

“Satisfactory Developed” overall performance

The control group posttest scores were distributed across ten reading indicators, with values ranging from 1.45 to 2.50. The computed mean of 1.718 indicates a “Satisfactory Developed” level of reading performance. Variability among scores suggests that while certain skills such as decoding showed strong improvement, others such as comprehension and engagement exhibited moderate gains. Overall, the distribution reflects a consistent improvement from the pretest performance.

Experimental Group Posttest Scores

Based on your indicators and expected improvement from the D.I.C.E. tool:

Indicator	Experimental Posttest
Decoding letters and sounds	2.7
Recognition of high-frequency words	2.3
Identify and read simple words	2.25
Comprehension	2.1
Answering questions	2.2
Fluency	2.5
Engagement	2.6
Recall/retell	2.3
Confidence	2.55
Context clues	2.2

Computed Statistics (Experimental Group)

Mean (Experimental): ≈ 2.37

Standard Deviation: ≈ 0.21

n = 10

Mean (Control): 1.718

Standard Deviation (computed): ≈ 0.34

n = 10

Independent Samples t-test Computation

Formula:

$$t = \frac{M_1 - M_2}{\sqrt{\frac{s_1^2}{n_1} + \frac{s_2^2}{n_2}}}$$

Substituting values:

$$t = \frac{2.37 - 1.718}{\sqrt{\frac{0.21^2}{10} + \frac{0.34^2}{10}}}$$

$$t = \frac{0.652}{\sqrt{0.00441 + 0.01156}}$$

$$t = \frac{0.652}{\sqrt{0.01597}} = \frac{0.652}{0.126}$$

$$t \approx 5.17$$

Degrees of Freedom

$$df = n_1 + n_2 - 2 = 18$$

Decision Rule

$$\alpha = 0.05$$

Critical t (df = 18) $\approx$ **2.101**

Decision

$$5.17 > 2.101$$

Reject the null hypothesis

Interpretation

The independent samples t-test revealed a statistically significant difference between the posttest scores of the control group (M = 1.718) and the experimental group (M = 2.37), $t(18) = 5.17$, $p < 0.05$.

This indicates that:

The experimental group performed **significantly better** than the control group.

The **D.I.C.E. Game-Based Reading Tool** was more effective than traditional materials in improving reading performance.

Effect Size (Cohen's d)

$$d = \frac{M_1 - M_2}{SD_{pooled}}$$

Pooled SD $\approx$ 0.28

$$d = \frac{0.652}{0.28} \approx 2.33$$

d = 2.33 $\rightarrow$ VERY LARGE EFFECT

How do learners respond to the game-based activities in terms of motivation, engagement, and enjoyment during reading sessions?

Learners Respond	Numerical Mean Value	Interpretation
Game-Based Reading Tool Objective	1.39	Needs to be Developed

Lesson Activity: Vowel Letters and Sound Recognition	3.49	Very Satisfactory – Developed
Lesson Activity: Consonant Letters and Sound Recognition	3.33	Very Satisfactory – Developed
Lesson Activity: Syllable Reading Test	1.55	Satisfactory – Developed
Lesson Activity: Consonant-Vowel-Consonant, Vowel-Consonant-Vowel, and Consonant-Vowel-Consonant-Vowel-Vowel Recognition	1.5	Satisfactory – Developed
Lesson Activity: Word Recognition	1.42	Needs to be Developed
Lesson Activity: Phrases and Sentences Reading Test	1.32	Needs to be Developed
Lesson Activity: Reading Comprehension Test	1.22	Needs to be Developed
Average Weighted Mean	1.9	Satisfactory – Developed

In Table 4 shows how the learners respond to the game-based activities in terms of motivation, engagement, and enjoyment during the reading lesson activity.

As shown in the table 4, there were four (4) game-based activities which were Needs to be Developed. There were two (2) game-based activities which Satisfactory Developed. Meanwhile, there was one (1) only game-based activity which was Very Satisfactory Developed.

SUMMARY, CONCLUSION, AND RECOMMENDATIONS

Summary of Findings

The study's findings revealed that the reading performance of emergent learners prior to the implementation of the Decoding, Identification, Comprehension, and Engagement (D.I.C.E): A Game-Based Reading Tool was generally low. Pretest results indicated that many learners struggled with foundational reading skills, including letter-sound recognition, syllable decoding, word recognition, reading fluency, and basic comprehension. These results suggest that the learners were at the emergent reading level before the intervention.

After exposure to the D.I.C.E: A Game-Based Reading Tool, integrated with the traditional Cartilla Approach employing alphabetical order, the learners in the experimental group demonstrated notable improvement in their reading performance. Posttest results showed enhanced proficiency across all assessed reading components, reflecting increased mastery of decoding skills, improved word recognition, greater reading fluency, and better comprehension. Statistical analyses further confirmed a significant difference between the pretest and posttest performance of the experimental group, indicating that the improvement was attributable to the intervention.

Moreover, compared with the control group that received traditional reading instruction, the experimental group obtained higher posttest and gain scores, indicating the effectiveness of the game-based reading tool. Observational data likewise revealed heightened motivation, engagement, and interest among learners during reading activities. Overall, the findings affirm that the D.I.C.E Game-Based Reading Tool is an effective instructional intervention that significantly enhances both reading performance and learner engagement among emergent learners.

Conclusion

Based on the study's findings, the Decoding, Identification, Comprehension, and Engagement (D.I.C.E) Game-Based Reading Tool, when integrated with the traditional Cartilla Approach, is an effective instructional intervention for improving the reading performance of Emergent learners. The significant improvement observed

in the learners' posttest scores, particularly in letter and sound recognition, syllable decoding, word recognition, reading fluency, and basic comprehension, indicates that the intervention successfully addressed their foundational reading difficulties.

Furthermore, the significant difference between the pretest and posttest performance of the experimental group, as well as the higher achievement and gain scores compared to the control group, confirms that the improvement in reading performance is attributable to the use of the D.I.C.E Game-Based Reading Tool rather than to traditional instruction alone. The increased motivation, engagement, and active participation of learners during reading sessions further highlight the instructional value of integrating game-based learning in early literacy instruction.

Therefore, it is concluded that the D.I.C.E Game-Based Reading Tool, when combined with the Cartilla Approach, provides an engaging and effective strategy for enhancing early reading skills among emergent learners and may serve as a viable instructional support for early literacy development in public elementary schools.

Recommendation

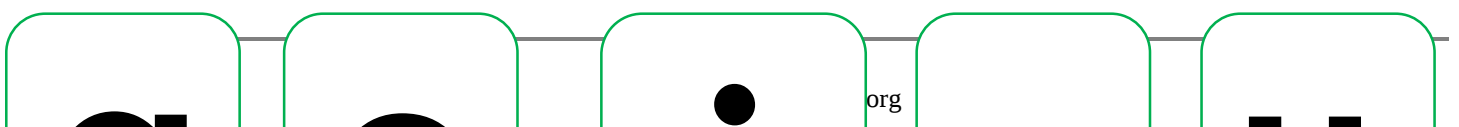
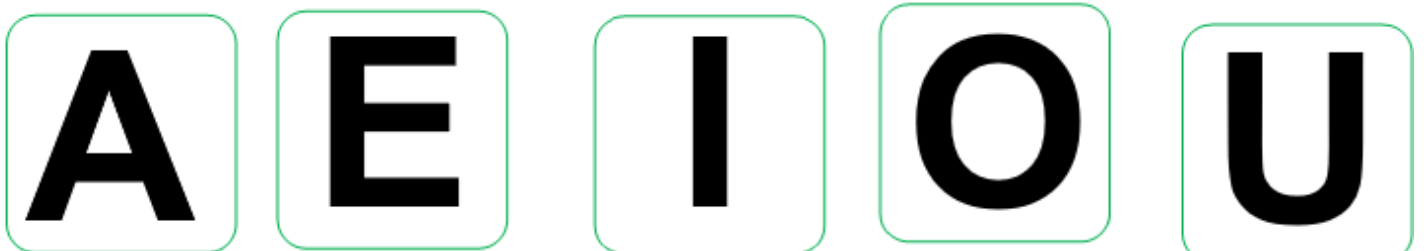
Based on the findings and conclusions of the study, the following recommendations are presented, aligned with the specific problems investigated:

First, in relation to the identified low reading performance of emergent learners prior to the intervention, teachers are encouraged to regularly assess learners' foundational reading skills—particularly letter recognition, phonemic awareness, word recognition, fluency, and comprehension—to identify struggling readers early and provide timely and appropriate instructional support.

Second, in response to the significant improvement in reading performance after the use of the Decoding, Identification, Comprehension, and Engagement (D.I.C.E) Game-Based Reading Tool, Grade 1 teachers are strongly encouraged to integrate the D.I.C.E Game-Based Reading Tool as a supplementary reading strategy alongside the traditional Cartilla Approach to enhance learners' decoding skills and overall reading development.

Third, considering the significant difference between the experimental and control groups, School administrators and reading coordinators are encouraged to support the adoption of game-based reading interventions by providing instructional resources, teacher training, and monitoring mechanisms to ensure effective and consistent implementation in early-grade reading programs. Finally, regarding learners' positive responses in terms of motivation and engagement, future researchers are encouraged to conduct further studies with larger samples, longer intervention periods, or across different grade levels to validate and expand findings on the effectiveness of game-based reading tools across both cognitive and affective aspects of early literacy. Below is the instrument of **Decoding, Identification, Comprehension, and Engagement (D.I.C.E.) Reading Tool**. Moreover, this instrument will be written on a dice box, and the learners will toss it before reading the sounds, syllables, words, phrases, sentences and story

Intervention Decoding, Identification, Comprehension, and Engagement (D.I.C.E) Game-Based Reading Tool Decoding and Identification (Ang Patinig)



Aa

Ee

li

Oo

Uu

Phase 2 Instrument (Week 3 - 5)- Decoding and Identification An Katinig

B

K

D

G

H

L

M

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Ng

P

R

S

T

W

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Malit na Katinig

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z

Bb

Kk

Dd

Gg

Hh

Ll

Mm

Nn

Ngng

Pp

Rr

Ss

Tt

Ww

Yy

Cc

Ff

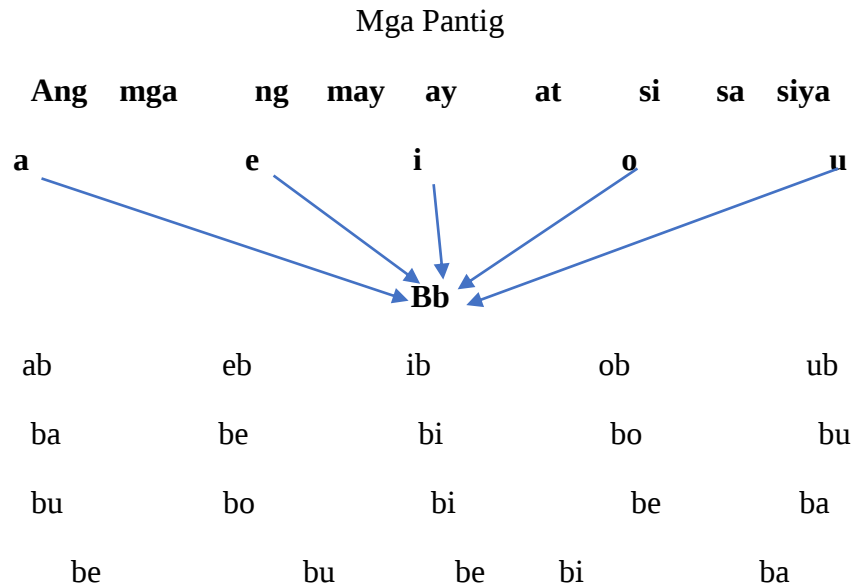
Jj

Qq

Vv

Zz

The ang, mga, ng, may, ay, at, si, sa will serve as sight words of Decoding, Identification, Comprehension, and Engagement (D.I.C.E) Game-Based Reading Tool for Grade 1.



PHASE 4 Instrument (Week 8)

Mga Salita

aba babae

bibo bao ubo

baba bebe ibaba

bababa Iba iba- iba

uubo

PHASE 5 Instrument (Week 9)

Mga Parirala

Ang babae	baba ang bebe
ay bibo	ubo ng ubo
ibaba ang	uubo ang
ay bababa	sa baba si Iba

Mga Pangungusap

Ang babae ay bababa.

Ang babae ay bibo.

Aba! Ubo ng ubo si Iba.

Bababa si iba sa baba.

PHASE 6 Instrument (Week 10) -Comprehension and Engagement

Ang Babae

Ang babae ay si Iba

Babaa si Iba.

Aba! may ubo

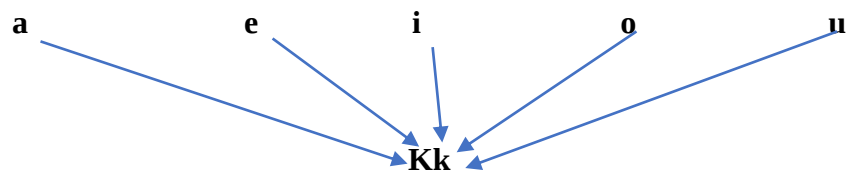
May ubo si Iba

Bababa si Iba na may ubo.

1. Sino ang babae?
2. Anong sakit ni Iba?
3. Bakit siya nagkaubo?

Kk

Ang mga ng may ay at si sa siya



ak ek ik ok uk

ka ke ki ko ku

ku ko ki ke ka

ke ku ke ki ka

Mga Salita

ako Iko ika- ika kaki Kiko kuko

Mga Parirala

mga kuko may kuko ang kaki

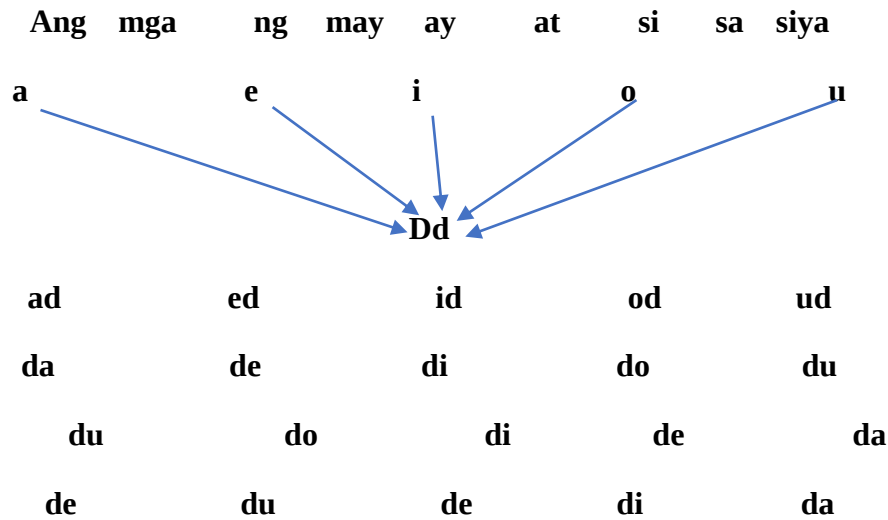
Mga Pangungusap

Ako ay may kuko.

Si Kiko ay iika – ika.

May kaki si Iko.

Dd



Mga Salita

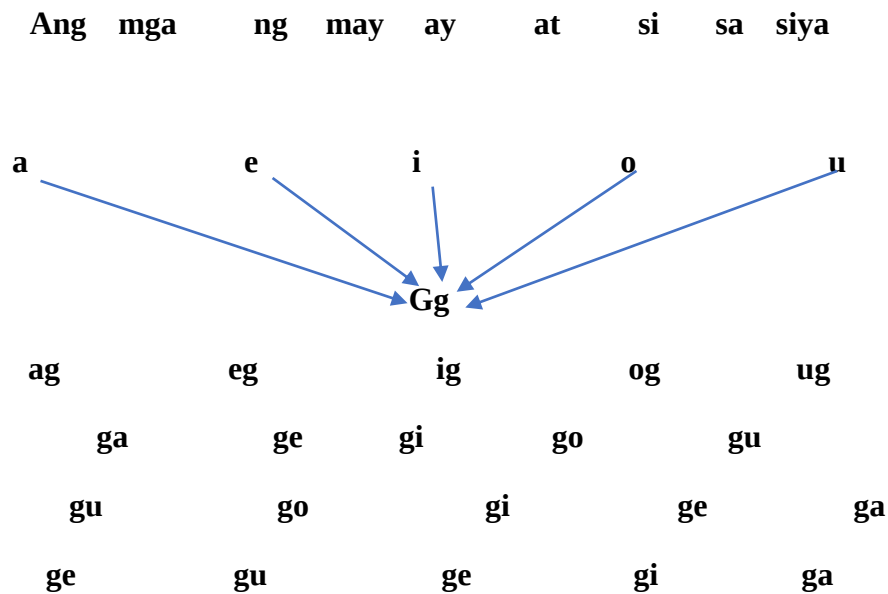
dada Edu dede
dadi Dado duda
ang dede mga dadi

Mga Pangungusap

Ang mga dadi ay may duda kay Edu.

Si Dido ay may duda.

Gg



Mga Salita

Aga gago igo uga-uga

gaga

Gigi

giga

gugo

aga

Mga Parirala

ang gaga

may igo

mga gago

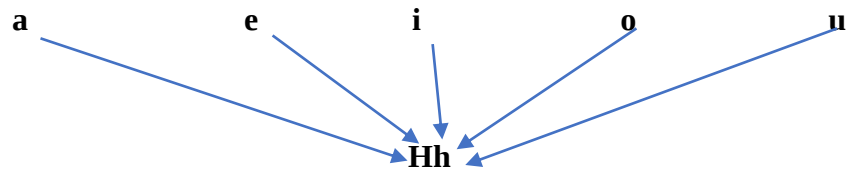
Mga Pangungusap

Si Aga ay may igo.

Aba! Ang aga ko.

Hh

Ang mga ng may ay at si sa siya



ah	eh	ih	oh	uh
ha	he	hi	ho	hu
hu	ho	hi	he	ha
he	hu	he	hi	ha

Mga Salita

aha Iha iho uha

Mga Parirala

mga uha ang iha

Mga Pangungusap

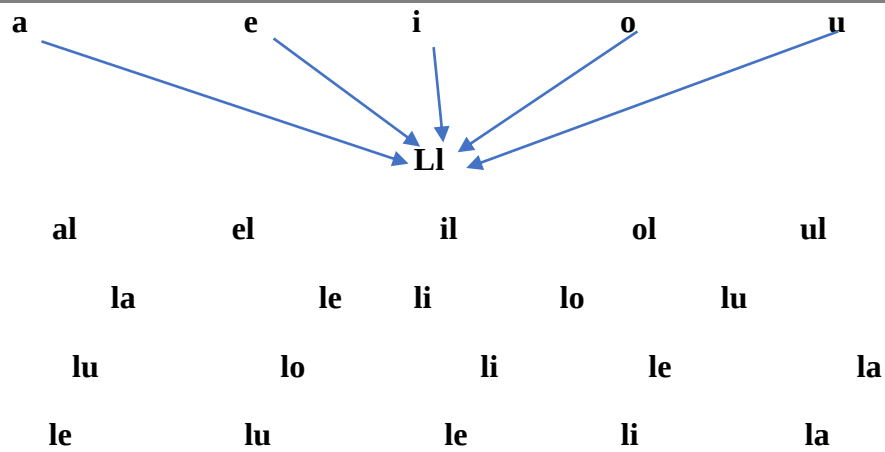
Ang iha at iho.

Si iho ay uuha

Aha! Si Iha ay uha ng uha.

Ll

Ang mga ng may ay at si sa siya



Mga Salita

Lala lola lila
lolo ulo lalo lula

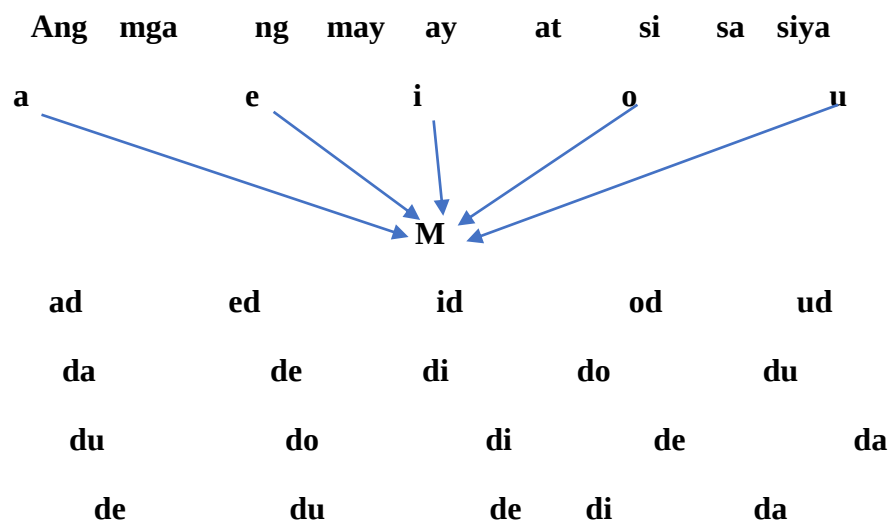
Mga Parirala

mga lila ang mga lolo
may lila si lol ang lola

Mga Pangungusap

Si lala ay lula lalo.
Ang lola ay may lila.
Aba! Si lolo ay lula.

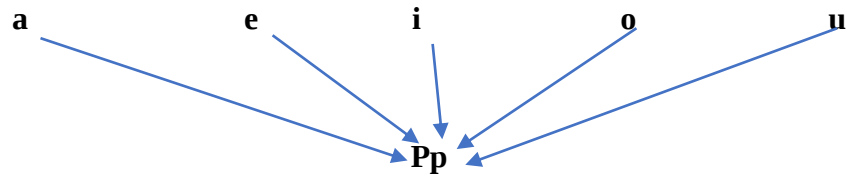
Mm



Mga Salita

ama amo Emma momo mama

Ang mga ng may ay at si sa siya



ap ep ip op up
pa pe pi po pu
pu po pi pe pa
pe pu pe pi pa

Mga Salita

apa papa Pipo opo
upo upa pepe apo
ipo-ipo paa

Mga Parirala

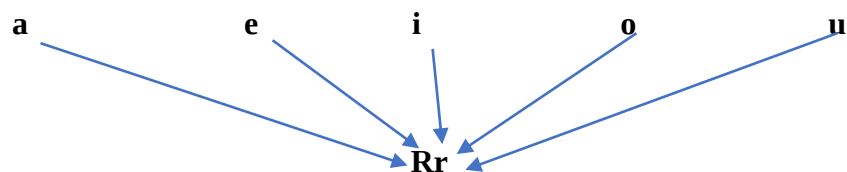
paa ni papa si Pipo
mga apa mga upo
ang pepe may upa

Mga Pangungusap

Si papa ay may upo.
May apa si Pipo.
Pepe si Pipo.

Rr

Ang mga ng may ay at si sa siya



ar er ir or ur
ra re ri ro ru
ru ro ri re ra
re ru re ri ra

Mga Salita

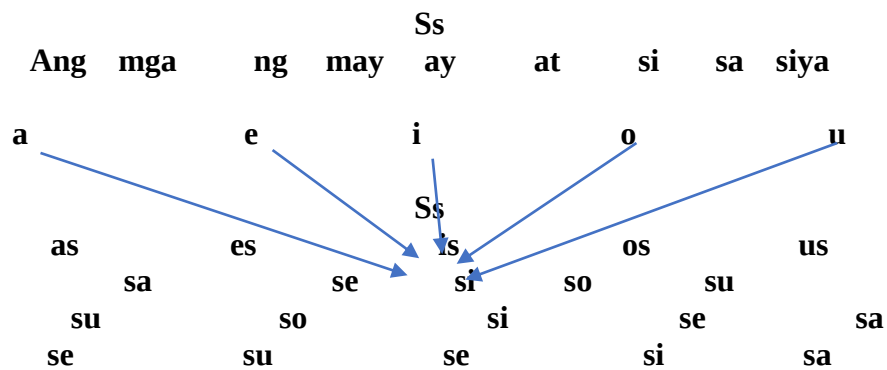
araro roro Ruru
ari uri iri

Mga Parirala

mga uri ang roro
may ari si Ruru mga araro

Mga Pangungusap

May roro si Ruru.
Si Ruru ang may ari ng roro.
Ano ang uri ng araro?



Mga Salita

aasa isa usa sisi
Sisa aso susi suso

Mga Parirala

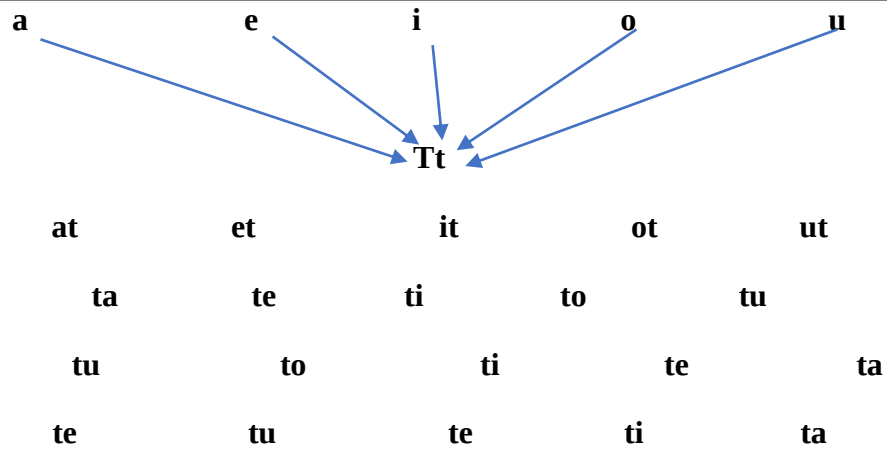
mga susi ang aso
ang sisi aasa sa
isa-isa Si Sisa

Mga Pangungusap

May aso si Sisa.
Iisa ang susi.
Aasa sa aso si Sisa.
May susi si Sisa.

Tt

Ang mga ng may ay at si sa siya



Mga Salita

ate ito Tito Tita
tuta totoo Ita tao

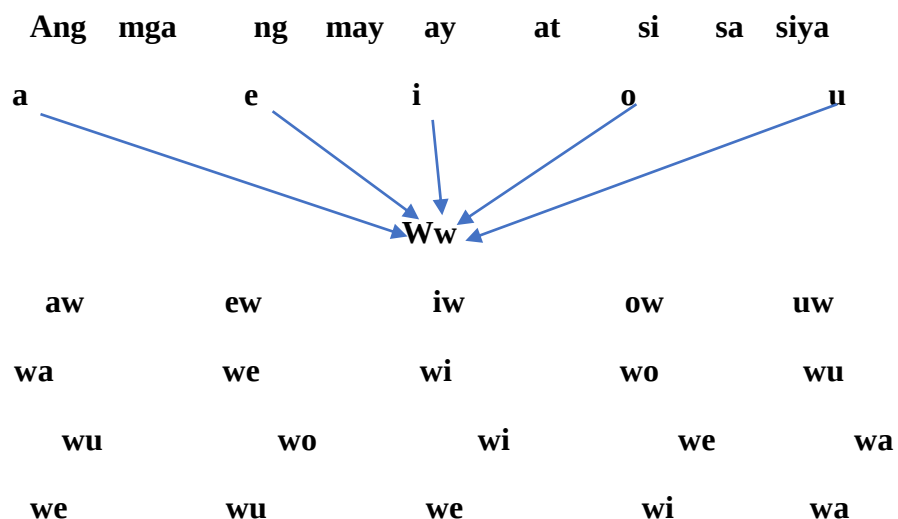
Mga Parirala

Si Tito mga tuta
Ang Ita totoo ang
Tita at Tito mga tao

Mga Pangungusap

Si Tita ay may tuta.
Ang mga Ita.
Ang mga tuta ng Ita.
Si Tito at Tita ay mga tao.

Ww



Mga Salita

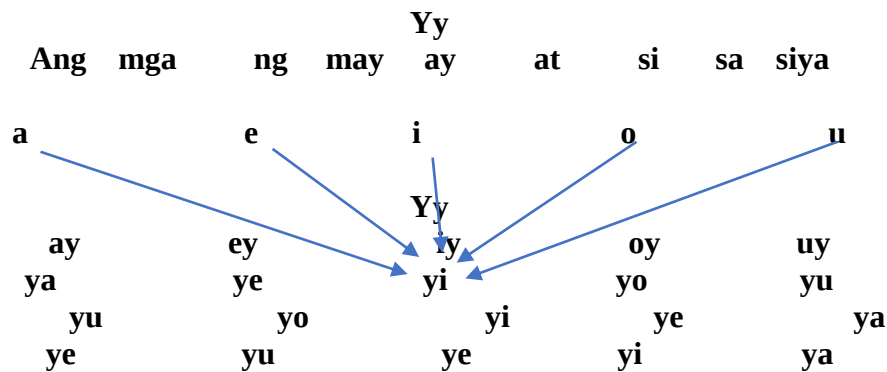
awa Wawe wiwi wowo
uwi wawa

Mga Parirala

ang awa uuwi si
may awa Si Wawe

Mga Pangungusap

May awa si Wawe.
Uuwi si Wawe.
Si Wawe ay uuwi.



Mga Salita

aya yaya yoyo Yayi
iyo yayo

Mga Parirala

mga yoyo iyo ang ang yaya aya si Yayi

Mga Pangungusap

Ang yoyo ni Yaye.
Ito ay yoyo.
Ang yaya ni Yaye.
Iyo ang yoyo?

REFERENCES

1. Adipat et al. (2021). Game Strategies to Engage and Empower Students.

2. Hempenstall, K. (February 26, 2023). Addressing Reading Failure at the Secondary Level. National Institute for Direct Instruction.
3. Pelayo, R., Alovera, R. N., Borbon, J. M., Calizo, A. B., Filomeno, B., Laureano, G., & Rivera, D. D. (2021). A Study of Philippine Educational Situations from Basic Education Teachers' Perspectives During the COVID-19 Pandemic. *Academy of Educational Leadership Journal*, 25(5), pp. 1–20.
4. Semilla, J. B., Parmisana, V. R., Fajardo, L. L., Abucayon, R. L., Dinoro, A. P., & Tabudlong, J. M. (2023). Innovation in Early Reading Instruction: The Development of e-Learning Materials in Mother Tongue. *International Journal of Learning*.
5. (2022). A meta-analysis: Focus on learning and development—individual Differences 93.
6. Alotaibi (2024) Game-Based Learning in Early Childhood Education.
7. Wang, H., & Yuan (2024). Enhancing Reading Instruction Through Gamification.
8. Hutabarat & Zaidi (2021). Improving Reading Skill through Game Technique for the First Grade.
9. Grace, R. A. (2021). Improving Students' K-PREP Reading Scores by Investigating the Reading Culture at Harrison Independent School.