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About the Journal

It is with great pride and a sense of purpose that we present the inaugural volume of **UBBOG: The Pre-Service Teachers' Research Journal** of Philippine Normal University North Luzon, Philippines.

The name of this journal, "**Ubbog**," carries profound significance. In its literal sense, it refers to a spring with continuously flowing water. Within these pages, it serves as a powerful metaphor for the nature of action research as an academic inquiry: a tireless and continuous quest for knowledge. Just as a natural spring provides a constant stream of life-sustaining water, the research conducted by the students provides a constant stream of fresh insights and evidence-based practices that sustain the field of education.

Crucially, this journal features the classroom-based action researches (CBARs) of pre-service teachers. These studies represent the vital intersection of theory and practice, where emerging educators investigate real-world dynamics to improve learning outcomes. By focusing on the classroom, our pre-service teachers are not only solving immediate pedagogical challenges but are also contributing to the broader body of educational knowledge.

For a pre-service teacher, engaging in this research is more than an academic requirement. It is the beginning of a lifelong commitment to professional growth and reflective practice. The studies featured here are the first ripples of what we hope will become a vast ocean of contribution to the teaching profession.

As you read through these articles, we invite you to appreciate the dedication and curiosity of these emerging educators. May the "Ubbog" of their research inspire you to continue your own flow of discovery, ensuring that the pursuit of excellence in education remains a journey without end.

-Faculty of Teacher Development

**UBBOG: The Pre-Service Teachers' Research Journal of Philippine Normal University
North Luzon**

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Michelle Jean Tiam, Antonio R. Agnes Jr., Janella Keith M. Amurao, Princess May L. Balico, Priscilla F. Berganio, Regine D. Blaza, Michelle A. Bulan, Asia Mae M. Causo, Cherry Rose de Guzman, Joanna Marie M. Dela Cruz, Daren Claire S. Doria, Kathleen B. Fernandez, Marc Vincent Julian, Rhea C. Macabitas, Jenielyn G. Maddela, Michaelah L. Martinez, Rosemarie Mortiz, Shane Ann P. Nacino, Trisha Ann C. Papa, Arjay D. Payang, Dannitz Ruzchel Quiben, Niña Ayella C. Ramil, James Nathaniel A. Ramos, Abigail B. Reyes, Ivory Mae S. Rosete, Joylyn D. Servano

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Abstract

This study described the efficacy of Project MASTER., a multisensory instructional intervention designed to enhance the initial sound identification skills of kindergarten learners. Employing a one-group pre-test/post-test action research design, the study purposively sampled 18 "at-risk" learners across three public elementary schools. The intervention utilized a structured, "Circuit-Style" rotation of four specialized pedagogical kits—Letter Sound Slides, Sorting Jars, Spelling Sheets, and *Marungko* Sequence Integration—to systematically engage learners through visual, auditory, kinesthetic, and tactile (VAKT) modalities. Quantitative analysis of data from the Early Grade Reading Assessment (EGRA) and standardized observation checklists revealed a statistically significant escalation in phonemic proficiency. The cohort's pre-test mean score of 3.56 ("Low Performers") rose to a post-test mean of 8.33 ("High Performers"), demonstrating a highly significant intervention effect ($p < .001$). Concurrently, behavioral metrics for behavioral engagement and task persistence achieved absolute mastery ($M = 4.00$). These empirical findings demonstrate that multimodal learning kits effectively reify abstract phonemes into concrete cognitive schema, establishing a robust foundation for early literacy acquisition.

Keywords: *Multisensory Instruction, Phonemic Awareness, Initial Sound Identification, Kindergarten Learners, Early Reading, Marungko Approach, Literacy Development, Letter-Sound Recognition*

Introduction

Early literacy development is widely recognized as a crucial foundation for academic success and lifelong learning. One of the most essential components of early literacy is phonological awareness, which refers to the ability to recognize, identify, and manipulate sounds in spoken language. Research consistently indicates that phonological awareness, particularly initial sound identification, serves as a strong predictor of later reading achievement because it enables children to connect spoken language with written symbols (Walker, 2023; Prasetyaningrum & Magfiratunnisa, 2024).

In the Philippine educational context, the Department of Education Kindergarten Curriculum Guide highlights the importance of developing alphabet knowledge and phonological

awareness as key competencies in early language and literacy instruction. However, many kindergarten learners encounter difficulties when transitioning from recognizing spoken sounds to associating them with written letters or graphemes. This challenge arises because phonemes are abstract units of language, which can be difficult for young learners to conceptualize without concrete experiences.

Traditional instructional approaches often rely on rote memorization and teacher-led drills, which may not effectively address the diverse learning styles of young children. Contemporary research in literacy education emphasizes the importance of multisensory instruction, which integrates visual, auditory, kinesthetic, and tactile learning modalities to support deeper understanding and memory retention. According to the Orton–Gillingham multisensory instructional theory, engaging multiple sensory pathways simultaneously strengthens neural connections in the brain and facilitates more effective language acquisition (Stewart, 2011; Dixon, 2022).

Studies further demonstrate that multisensory approaches improve letter–sound knowledge, phonemic awareness, and decoding skills among early readers (Walker, 2023). Activities that involve movement, manipulation of materials, and auditory reinforcement allow learners to internalize phonetic patterns more effectively than purely auditory instruction. Kinesthetic engagement, such as physical movement linked to sound recognition activities, has been found to significantly enhance memory retention and learner participation.

In addition, early literacy assessment frameworks such as the Early Grade Reading Assessment (EGRA) emphasize initial sound identification and letter-sound recognition as fundamental competencies for emergent readers. EGRA-based studies highlight that learner who develop strong phonemic awareness during kindergarten demonstrate significantly improved reading outcomes in later grades (Bautista, 2019; Casido, 2024).

Recognizing these findings, this study introduces Project MASTER (Multisensory Aids for Sound-Technique and Early Reading), an instructional intervention designed to support kindergarten learners in identifying initial sounds through multisensory learning kits. The project incorporates interactive materials such as the Letter Sound Slide and Sorting Jars, which engage learners through visual, auditory, kinesthetic, and tactile experiences. By transforming abstract phonemes into concrete, hands-on activities, the intervention aims to improve learners' ability to recognize and associate initial sounds with their corresponding letters.

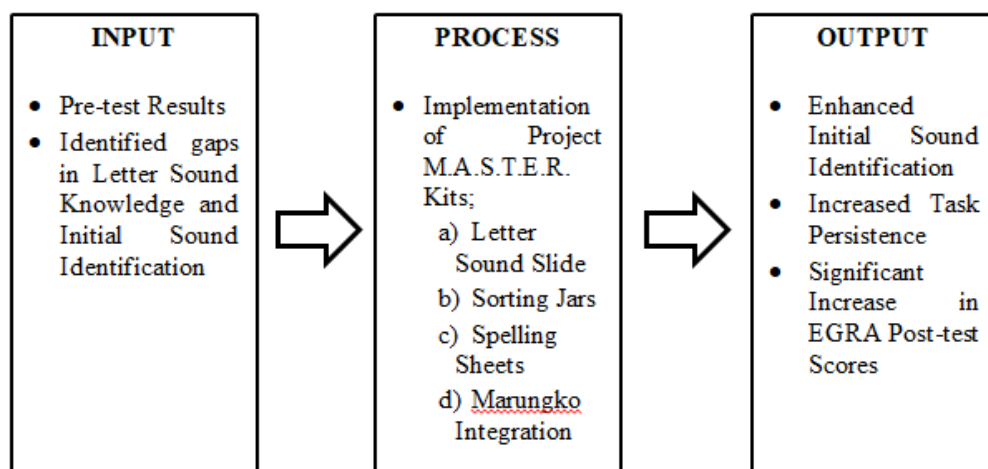
Through the implementation of these multisensory strategies, the study sought to determine whether Project MASTER can effectively enhance the initial sound identification skills of kindergarten learners, thereby strengthening the foundation for early reading development. Specifically, this study aimed to: 1) Determine the pre-test performance of the learners in initial sound identification based on the Early Grade Reading Assessment (EGRA); 2) Assess the level of the Learners across the domains of the following: a) Phonetic Accuracy, b) Visual–Auditory Association, c) Grapheme Recognition, d) *Marungko* Integration, and e) Task Persistence; 3)

Determine the post-test performance of the learners after the implementation of the Project MASTER, and 4) Determine the difference between the pre-test and post-test scores of the learners after the intervention.

Figure 1 illustrates the conceptual framework of the study using the Input-Process-Output (IPO) model. The Input phase identifies the learners' initial literacy levels through the EGRA pre-test. The Process phase details the intervention through the four specialized multisensory kits of Project MASTER, emphasizing the VAKT (Visual, Auditory, Kinesthetic, and Tactile) modalities. Finally, the Output signifies the measurable improvement in the learners' phonemic awareness and the overall efficacy of the multisensory instructional approach.

Figure 1

The Conceptual Framework



Methodology

The study employed a One-Group Pre-test Post-test Action Research Design. This quasi-experimental approach is specifically suited for classroom-based interventions where the researcher aims to evaluate the impact of a new instructional tool (Project MASTER) on a single group of learners. By comparing the baseline data from the pre-test to the results of the post-test, the study identifies the "gain scores" and statistical significance attributable to the multisensory intervention.

A total of eighteen (18) kindergarten learners participated in the study, drawn from three different public schools to ensure a broader observation of the intervention's effectiveness. The distribution of participants was as follows: 12 learners from School A, 2 from School B, and 4 from School C. The researchers utilized Purposive Sampling, a non-probability sampling technique where participants are selected based on specific characteristics. In this study, classroom advisers recommended learners who were identified as "at-risk" or "struggling" in early literacy,

specifically those who scored below the proficiency threshold in initial sound identification during preliminary screenings.

The intervention consisted of a two-week intensive program comprising 10 sessions (60–90 minutes each). The instruction was delivered through a "Circuit-Style" rotation involving four specialized multisensory kits:

Letter Sound Slide (Kinesthetic). Learners physically engaged in gross motor movement (climbing and sliding) while simultaneously vocalizing the target phoneme.

Sorting Jars (Visual-Auditory). A categorization task where learners matched picture cards to jars labeled with specific graphemes, reinforcing sound-to-symbol association.

Spelling Sheets (Tactile). Learners used three-dimensional wooden letters to "build" the graphemes on laminated sheets, engaging fine motor skills and tactile memory.

Marungko Integration. All activities followed the localized Marungko Approach sequence (m, a, i, s, etc.), ensuring the intervention remained culturally and linguistically relevant to the Philippine context.

Data triangulation was achieved through two primary tools: 1) Early Grade Reading Assessment (EGRA): A standardized, internationally recognized tool used to provide quantitative data on Letter Sound Knowledge and Initial Sound Identification and 2) Researcher-Adapted Observation Checklist: A 4-point Likert scale was used to measure behavioral mastery. The instrument underwent face validation by a panel of expert educators to ensure the indicators were developmentally appropriate for five-year-old learners.

The data collected from the EGRA and the observation checklists were subjected to statistical treatments to ensure a rigorous evaluation of Project MASTER. To answer the research questions regarding performance levels, the Arithmetic Mean and Standard Deviation were calculated. For the observation checklist, a Weighted Mean was computed for each domain.

To determine if a significant difference existed between the pre-test and post-test scores, a Paired Samples T-test was employed. This tool was chosen because it compares the means of the same group of participants at two different points in time. The significance level was set at 0.05 alpha, and the resulting p-value was analyzed to confirm the effectiveness of the multisensory intervention. The Mean Percentage Score (MPS) was also derived from the raw EGRA scores to provide a standardized view of the learners' performance relative to the total possible score, allowing for a clearer comparison of growth across the intervention period.

The researchers secured necessary permissions from the school heads of the three participating institutions. To protect the privacy of the minors involved, all data were anonymized, and informed consent was coordinated through the classroom advisers and parents/guardians. Also, the researchers conducted debriefing to ensure beneficence.

Results and Discussions

The pre-test results, indicating a total percentage of 36.67% and a "Low Performer" status, highlight a significant gap in the learners' foundational literacy. This baseline data aligns with the Department of Education Kindergarten Curriculum Guide, which identifies phonological awareness and alphabet knowledge as essential competencies that many learners struggle to master without targeted support. Researches by Walker (2023) and Prasetyaningrum and Magfiratunnisa (2024) consistently indicate that the ability to identify initial sounds is a critical predictor of later reading achievement, as it serves as the bridge between spoken language and written symbols.

The data showing that learners are "Low Performers" in sounding out specific phonemes like /i/, /b/, /n/, /p/, /r/, and /l/ underscores the abstract nature of phonemes, which contemporary research describes as difficult for young children to conceptualize through traditional rote memorization or teacher-led drills alone. Furthermore, Early Grade Reading Assessment (EGRA) frameworks emphasize that failing to develop these fundamental competencies during kindergarten can lead to persistent difficulties in decoding and reading comprehension in later grades. As noted by Casido (2024), learners who struggle with initial sound identification require immediate, evidence-based interventions to improve their literacy trajectory before transitioning to the elementary level.

Table 1

Pre-Test Performance of the Learners Based on EGRA

Phoneme	Total Correct	Percentage Correct	Descriptions
/m/	14	77.78%	Moderate Performers
/s/	15	83.33%	High Performers
/i/	6	33.33%	Low Performers
/b/	3	16.67%	Low Performers
/t/	8	44.44%	Moderate Performers
/g/	10	55.56%	Moderate Performers
/n/	3	16.67%	Low Performers
/p/	3	16.67%	Low Performers
/r/	1	5.56%	Low Performers
/l/	3	16.67%	Low Performers
Total	66	36.67%	Low Performers

As to the performance of students in producing correct letter sounds using the "Letter Sound Slide" kit, the students obtained a grand mean of 2.98, which falls under the Developing category. While students are relatively more stable at maintaining a sound throughout the duration of the slide (Mean = 3.17), they face challenges in initial sound production and distinguishing between phonetically similar letters like /b/ and /p/ (Mean = 2.89). This indicates that while the multisensory slide provides a helpful physical anchor, students require more repetitive practice to achieve phonetic precision.

Recent studies highlight that multisensory and structured phonemic instruction enhances early literacy skills. Kilat and Apas (2025) reported that engaging visual, auditory, and kinesthetic modalities significantly improved phonemic awareness and sound–letter correspondence in first graders. Similarly, Valladolid and Estremera (2026), emphasized that explicit, systematic practice is crucial for refining phonetic accuracy, particularly in distinguishing similar phonemes. These findings support the present results, indicating that while multisensory tools aid sound maintenance, targeted, repetitive practice is necessary to improve initial sound production and phoneme discrimination.

The ability of students to link sounds to visual objects was measured using the "Sorting Jars" kit. With a grand mean of 3.35, the students have reached the Mastered level in this domain. A notable strength is their ability to identify the objects on the laminated cards (Mean = 3.72). However, the actual sorting process—linking that object to its specific initial sound jar—is still in the Developing stage (Mean = 3.11). This suggests that the students have strong vocabulary recognition, but the cognitive leap to sound-symbol association is still maturing.

These observations are consistent with recent evidence indicating that sound–symbol association and phonological awareness are foundational to emergent literacy, yet develop at different rates. Mehlhase et al. (2025), found that sound–symbol learning tasks predict early literacy skills such as spelling and decoding, demonstrating that the ability to connect sounds with visual symbols (letters or objects) significantly contributes to foundational reading outcomes, particularly when phoneme awareness is involved. Additionally, Nkurunziza (2024), emphasized that phonological awareness underpins early reading development, serving as a prerequisite for decoding and literacy acquisition, and that systematic instruction in sound–symbol relationships strengthen students' ability to translate auditory input into symbolic representation. These findings support the interpretation that while learners can recognize object labels robustly, further targeted practice is needed to consolidate the cognitive mapping between sounds and visual symbols, which underlies skilled decoding and emergent reading.

Results of the "Spelling Sheets" kit, which assesses the students' ability to recognize and manipulate printed and wooden letters obtained the grand mean of 3.22 which indicates a Developing level of mastery. Students were most successful at pointing to or naming printed letters (Mean = 3.28). The physical manipulation aspect, such as orienting the wooden letters correctly (Mean = 3.17), presented more of a challenge. This suggests that fine motor skills and spatial

orientation are integrated factors in their letter recognition process. These findings are supported by recent research emphasizing the role of motor involvement and fine motor development in early literacy acquisition. Frisk et al. (2020), found that motor-enriched learning activities significantly improved children's letter recognition, indicating that integrating movement and manipulation during letter learning can enhance engagement and retention of alphabet knowledge. Likewise, a study by Bara and Gentaz (2025), highlighted that handwriting gestures and physical interaction with letters contribute to stronger literacy development by strengthening the connection between visual letter forms and motor representations. These findings support the present results, suggesting that while learners can recognize printed letters, continued practice involving tactile manipulation and motor coordination is necessary to strengthen spatial orientation and letter-formation skills.

The integration of *Marungko* sounds resulted in a grand mean of 3.00 (Developing). Students showed a higher proficiency in identifying initial sounds for familiar Filipino words (Mean = 3.17) than they did in applying the specific "key word" sounds to the actual kits (Mean = 2.78). This underscores the importance of using culturally relevant and familiar vocabulary to bridge the gap in sound identification. Repaso and Macalisang (2024), emphasized that learners in the early stage of reading are often still developing fundamental skills like phonemic awareness and alphabet knowledge. As noted in their study, pupils prior to intervention were just beginning and developing their basic reading skills. This implies that while learners demonstrate emerging understanding of sound-symbol relationships, they still require guided instruction and continuous practice to achieve mastery in early literacy skills.

Beyond literacy skills, the study also measured the students' behavioral engagement and focus during the multisensory circuit. In contrast to the developing literacy skills, student engagement reached absolute Mastery with a perfect grand mean of 4.00. Every student remained focused on the circuit, demonstrated high levels of independence, and expressed visible joy throughout the process. These results indicate that the multisensory nature of Project MASTER is highly effective in motivating Kindergarten learners and sustaining their interest in academic tasks. Furthermore, this is supported by Kilat and Apas (2025), who found that engaging multiple modalities significantly improves participation and retention in first-grade literacy development.

The post-test performance results of the kindergarten learners based on the Early Grade Reading Assessment (EGRA) after the implementation of Project MASTER show a notable improvement in the learners' phoneme recognition compared to the pre-test results. The learners obtained a total score of 154 with a mean percentage score of 85.56%, interpreted as High Performers. Several phonemes such as /m/, /s/, and /g/ g/obtained 100% accuracy, while /b/, /i/, /r/, and /t/ also achieved high performance levels. Meanwhile, phonemes /n/, /p/, and /l/ were categorized as Moderate Performers, although their scores still improved compared to the pre-test. These results indicate that the learners developed stronger letter-sound recognition skills after the intervention.

The improvement may be attributed to the Project MASTER. Innovation, which implemented a two-week intensive multisensory intervention consisting of 10 sessions (60–90 minutes each) delivered through a circuit-style learning rotation. The activities included the Letter Sound Slide (kinesthetic learning), Sorting Jars (visual–auditory association), Spelling Sheets (tactile letter construction), and the *Marungko*-based phonics sequence. Research suggests that multisensory phonics instruction improves phonemic awareness and early reading skills because it engages visual, auditory, kinesthetic, and tactile learning modalities simultaneously (Cuccia, 2023; Doty, 2024; Solichah & Fardana, 2024). Furthermore, systematic phonics approaches such as the Marungko sequence help learners gradually develop grapheme–phoneme correspondence, which is essential for early literacy development. Studies indicate that structured phonics instruction significantly enhances young learners' decoding and phonological awareness skills (Indriani et al., 2025). Therefore, the results suggest that Project MASTER. Innovation effectively supported the improvement of the learners' phonemic awareness and early reading readiness.

Table 2

Post-Test Performance of the Learners After the Intervention

Phoneme	Total Correct	Percentage Correct	Descriptions
/m/	18	100.00%	High Performers
/s/	18	100.00%	High Performers
/i/	16	88.89%	High Performers
/b/	17	94.44%	High Performers
/t/	15	83.33%	High Performers
/g/	18	100.00%	High Performers
/n/	12	66.67%	Moderate Performers
/p/	11	61.11%	Moderate Performers
/r/	16	88.89%	High Performers
/l/	13	72.22%	Moderate Performers
Total	154	85.56%	High Performers

A paired samples t-test was conducted to assess the impact of the multisensory intervention on the initial sound identification skills of kindergarten learners, comparing baseline measurements to those observed after the intervention. The paired samples statistics reveal that, at baseline, the mean literacy score was 3.56 (SD = 2.79), and subsequently increased significantly

after the intervention to a mean of 8.33 (SD = 1.94). The paired samples correlations indicate a statistically significant correlation between baseline and post-intervention literacy levels ($r = .518$, $p = .028$), underscoring a consistent relationship in performance across the paired observations.

The paired samples test results reveal a statistically significant mean difference in literacy scores between baseline and post-intervention assessments ($M = -4.78$, $SD = 2.44$, 95% {CI} [-5.99, -3.56], $t(17) = -8.31$, $p < .001$). These findings provide robust evidence of a significant improvement in initial sound identification following the implementation of Project MASTER, emphasizing the effectiveness of the multisensory kits.

The significant leap in scores is deeply rooted in the Multisensory Instructional Theory, which suggests that engaging multiple senses—visual, auditory, and kinesthetic—creates stronger neural pathways for memory retention. The results from this study align with the findings of Birsh (2011), who noted that systematic multisensory instruction is vital for students in the beginning stages of reading.

Furthermore, the decrease in the Standard Deviation from the pre-test (2.79) to the post-test (1.94) suggests that the intervention was effective not just for a few students, but for the class as a whole, narrowing the achievement gap among the 18 learners. This academic growth is mirrored by the Mastered (4.00) levels of task persistence and joy observed during the circuit, supporting the idea that a high level of behavioral engagement is a primary driver for phonetic mastery in a kindergarten setting.

This research described the impact of Project MASTER on the initial sound identification skills of kindergarten learners, shifting from traditional rote drills to a multisensory, circuit-style intervention to bridge the gap between abstract phonemes and concrete learning experiences. Based on the empirical findings, several key conclusions are drawn. First, absent instructional methods that adequately address the abstract nature of phonemes, struggling kindergarten learners remain stagnant within the "Low Performer" category. Second, a structured multisensory intervention serves as a highly effective pedagogical tool for enhancing initial sound identification. Third, targeted tactile objects such as Sorting Jars successfully bridge the gap between initial vocabulary recognition and sound-symbol association. Fourth, the implementation of this intervention yields statistically significant and uniform literacy gains across the participant cohort. Finally, minimizing behavioral barriers directly facilitates optimal physical and sensory engagement, thereby optimizing early literacy acquisition.

Following the proven success of Project MASTER in improving initial sound identification among kindergarten learners, the following strategic recommendations are proposed to maximize educational impact. First, kindergarten teachers should adopt the "Circuit-Style" multisensory rotation as the standard remedial intervention for students flagged as "at-risk" during preliminary EGRA screenings, while continuing to integrate localized approaches like the *Marungko* sequence into multisensory kits to maintain cultural and linguistic relevance. Second, school administrators must prioritize teacher capacity building by hosting targeted workshops focused on constructing and utilizing low-cost VAKT materials, such as Letter Sound Slides and Sorting Jars, to ensure program sustainability. Finally, future researchers and implementers should extend the intervention timeline beyond two weeks to fully transition "Developing" skills—specifically fine

motor manipulation and phoneme discrimination—into "Mastered" levels, while conducting longitudinal studies to track the program's long-term impact on decoding and word-reading skills as learners transition into Grade 1.

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Improving the Mathematical Performance of Junior High School Students Through a Foundational Intervention in Arithmetic in Grade 7 Algebra

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Abstract

Filipino students face a persistent crisis in mathematics education, characterized by weak foundational numeracy and low proficiency in national and international assessments. Gaps in elementary arithmetic fluency often persist into secondary education, hindering the mastery of higher-order mathematical concepts. To address this challenge, this classroom-based action research investigated the effectiveness of a storybook-integrated lesson as an instructional intervention to improve students' conceptual understanding.

Using a quantitative, single-group pretest-posttest research design, the study assessed changes in learners' performance and measured their mean gain scores. The participants consisted of 150 Grade 8 students from four sections in a provincial junior high school, selected via convenience sampling based on classroom accessibility. Data collection involved administering a pretest to establish a baseline, implementing the contextualized narrative intervention on the Fundamental Counting Principle, and administering a posttest.

Keywords: *grade seven algebra, intervention, mathematical performance*

Introduction

The consistently low performance of Filipino students in mathematics has been a major concern in the country's education system. Results from the Programme for International Student Assessment (PISA, 2018) showed that 4 out of 5 Filipino students performed below the minimum proficiency level in mathematical literacy. The EDCOM II (2023) report further confirmed that weak foundational numeracy skills, particularly in arithmetic, significantly affect students' ability to grasp higher-order mathematical concepts. These findings reflect a nationwide challenge in developing learners' number sense, operational fluency, and problem-solving ability.

This situation confirms that the Philippines is facing a persistent and systemic problem in mathematics education. The widespread inability of learners to perform basic operations such as addition, subtraction, multiplication, and division reflects deep-rooted deficiencies in foundational instruction and skill retention. National assessment results consistently show that Filipino students demonstrate low proficiency in mathematics, with Grade 6 learners achieving only 41 percent mean proficiency in Math, classified as low mastery (Department of Education, 2023). International assessments further validate this concern, as more than 75 percent of Filipino

learners scored below the minimum level of proficiency in mathematics in the 2018 and 2022 PISA cycles (OECD, 2019; OECD, 2023). These findings indicate that many students complete several years of schooling without acquiring the essential numeracy skills required for higher-level learning. Researchers emphasize that gaps in arithmetic fluency and conceptual understanding developed in elementary school are carried into secondary education, where they become major barriers to learning algebra, geometry, and problem-solving (Bernardo, 2021; Garcia, 2023). As a result, junior high school teachers are forced to reteach basic concepts instead of advancing to grade-level competencies, reducing instructional efficiency and limiting academic progress.

The Human Capital Index further highlights this inefficiency, estimating that Filipino learners effectively gain only 7.5 years of actual learning despite spending an average of 12.9 years in school (World Bank, 2022). These realities demonstrate that the difficulty students experience with basic operations is not an isolated classroom issue but a national educational crisis. Addressing this challenge requires structured remediation programs, strengthened early mathematics instruction, and consistent monitoring of foundational skill development to prevent the continued cycle of learning deficits.

Beyond performance, storytelling also contributes to deeper learning processes. Narrative development improves creativity and allows for better knowledge retention. Afkar et al. (2024) emphasize that narratives enhance students' conceptual understanding of mathematical concepts while cultivating imagination. Digital storytelling further supports this by helping learners recognize the real-world relevance of mathematical ideas (Hernandez-Martinez & Keane, 2024). In this way, storytelling supports not only engagement but also the development of meaningful and lasting understanding.

However, despite these advantages, integrating storytelling into mathematics instruction presents challenges. One major difficulty lies in aligning narratives with mathematical ideas while maintaining instructional fidelity (Nepal & Shrestha, 2023). Unlike subjects where narratives naturally fit, mathematics requires careful integration to ensure that the story supports rather than distracts from the concept (NCTE, 2010; Miller & Pennycuff, 2008). Some educators equate storytelling with simple word problems, limiting its deeper potential (Junkin, 2022), while others struggle to design narratives that effectively represent mathematical structures (Kükey, Güneş, & Genç, 2022). Additionally, students' ability to extract mathematical meaning from stories varies depending on their background knowledge and cognitive abilities (Lemonidis & Kaiafa, 2019).

These challenges help explain why, despite its recognized benefits, the integration of storytelling in mathematics education remains underexplored. Mathematics is often viewed as abstract and independent of context (Nuñez, 2016; Meaney, 2010; Brandt & Chernoff, 2015; Shultz et al., 2023), which limits the use of narrative-based approaches in classroom practice (Golafshani, 2023). Moreover, there is a lack of practical instructional materials and structured approaches that guide teachers in effectively integrating storytelling into mathematics lessons (Leonard, 2018).

Given this gap, there is a need to examine how storytelling can be systematically integrated into mathematics instruction and how it influences students' conceptual understanding. In this regard, this classroom-based action research investigates the use of a storybook-integrated lesson as an instructional intervention. Specifically, it aims to assess students' conceptual understanding

before and after the implementation of the intervention, determine its effectiveness, and measure the mean gain in students' performance. The research questions are as follows: What is the level of students' conceptual understanding of the Fundamental Counting Principle before the use of the storybook-integrated lesson (pre-test scores)? What is the level of students' conceptual understanding of the Fundamental Counting Principle after the use of the storybook-integrated lesson (post test scores)? Is there a significant difference between the pre-test and post test scores?

Methodology

This study employed a quantitative research design, specifically the pretest-posttest design, to assess the effectiveness of a storybook-integrated lesson in improving students' conceptual understanding of the High School learners. A single group of participants is measured before (pretest) and after (posttest) the intervention to determine any significant improvement in learning outcomes. The pretest was administered to determine the students' baseline understanding of the Fundamental Counting Principle. Following this, the students were exposed to the storybook-integrated lesson, which aimed to enhance conceptual understanding through contextualized and engaging narratives. After the intervention, a posttest was conducted to measure any changes in students' understanding.

The difference between pretest and posttest scores was analyzed to determine the effectiveness of the intervention. Additionally, the mean gain score was computed to quantify the improvement in students' performance. This design is commonly used in classroom-based action research as it allows teachers to evaluate the impact of instructional strategies within a real classroom setting (Ishtiaq, 2019).

The respondents of the study were 150 Grade 8 students from four (4) sections in a provincial junior high school. To determine the appropriate sample size, the researchers used Slovin's Formula, which is commonly applied when the population size is known and a margin of error is specified. After determining the required sample size, the researchers employed convenience sampling in selecting the participants. In this study, the selected Grade 8 sections were chosen based on their accessibility and the researchers' direct teaching involvement, making data collection more feasible within the given timeframe.

Convenience sampling is commonly used in classroom-based action research because it allows researchers to implement and evaluate instructional interventions within their actual teaching context (Mertler, 2017). Although this method may limit the generalizability of the findings, it is appropriate for action research, which primarily aims to improve classroom practices and student learning outcomes. The selected participants were administered a pretest to assess their initial conceptual understanding of the Fundamental Counting Principle, followed by exposure to the storybook-integrated lesson. A posttest was then conducted to measure any improvement in their understanding after the intervention.

This study utilized a researcher-developed test instrument designed to measure students' conceptual understanding of the Fundamental Counting Principle. The instrument consisted of ten (10) multiple-choice items, combining direct problem-solving questions and story-based situations. The inclusion of narrative contexts aimed to assess not only procedural knowledge but

also students' ability to interpret and apply counting principles in meaningful scenarios. The test content focused on multiplication in counting and possible combinations, aligned with the Most Essential Learning Competencies (MELCs) for Grade 8 mathematics.

The same set of test items was used for both the pretest and posttest to allow for a direct comparison of students' performance before and after the intervention. Each item was scored as one (1) point, with a total possible score of ten (10). Although the instrument did not undergo formal validation or pilot testing, the items were carefully constructed by the researchers to reflect the targeted competencies and ensure clarity and appropriateness for the learners.

The data collection process followed a structured sequence. At the beginning of the study, the pretest was administered to establish the students' baseline level of conceptual understanding. Students were given sufficient time to complete the test under normal classroom conditions. Following this, the storybook-integrated lesson was implemented as the main instructional intervention. The lesson presented mathematical ideas through a narrative format, where students engaged with story-driven scenarios that required them to identify choices, analyze possible outcomes, and apply the Fundamental Counting Principle.

During the intervention, students participated in guided discussions and classroom activities designed to deepen their understanding of the concept. These activities encouraged learners to connect the events in the story with mathematical reasoning, allowing them to visualize counting processes and recognize patterns in possible combinations.

After the completion of the lesson, the same test was administered as a posttest to measure any changes in students' understanding. The results of the pretest and posttest were then collected, recorded, and prepared for statistical analysis to determine the effectiveness of the storybook-integrated approach.

To describe the students' level of understanding, descriptive statistics such as the mean and standard deviation were computed for both pretest and posttest scores. The pretest results served as the basis for identifying the students' initial level of conceptual understanding, while the posttest results reflected their level after the implementation of the storybook-integrated lesson. The scores were interpreted using set performance levels (e.g., low, average, and high) based on a scoring guide. To examine whether there was a significant difference between pretest and posttest results, a paired sample t-test was used. This statistical tool is appropriate for comparing two related samples to determine if there is a significant mean difference (Walpole et al., 2012).

Ethical standards were strictly observed to ensure the protection of participants' rights and the integrity of the research process. Prior to the administration of the pretest and posttest, permission was secured from the class adviser to conduct the study within the classroom setting. The nature and purpose of the study, the voluntary nature of their participation, and their right to withdraw at any time without consequence were clearly explained. Participants were also informed about how the data would be used and stored. To safeguard participants' privacy and personal information, the study complied with the provisions of the Data Privacy Act of 2012 (Republic Act No. 10173). All data collected were kept strictly confidential and were anonymized

to ensure that no individual can be identified in the final report. Personal identifiers were removed or coded, and access to raw data was limited only to the researchers directly involved in the analysis. Through these measures, the study upheld the ethical principles, ensuring the dignity, rights, and safety of all participants involved.

Results and Discussions

This section presents the findings of the study on the effectiveness of the storybook-integrated lesson in improving students' conceptual understanding of the Fundamental Counting Principle. The results include the descriptive statistics of the pre-test and post-test scores, followed by the results of the paired-samples t-test and the computed mean gain scores of the students.

The pre-test results revealed that the students obtained a mean score of 4.08 with a standard deviation of 1.85, and scores ranging from 0 to 9. These results indicate that, prior to the implementation of the storybook-integrated lesson, students had a low level of conceptual understanding of the Fundamental Counting Principle. The relatively low mean suggests that many students experienced difficulty in understanding and applying the concept before the intervention.

After the implementation of the storybook-integrated lesson, the post-test results showed a mean score of 8.85 with a standard deviation of 1.43, and scores ranging from 3 to 10. This indicates that students achieved a high level of conceptual understanding of the Fundamental Counting Principle. The noticeable increase in the mean score suggests that the students were able to better grasp and apply the concept after engaging with the story-based activities.

Table 1

Pre-test and Post Test Scores

No.	WISDOM		FORTITUDE		HOPE		HONESTY	
	PRE TEST	POST TEST	PRE TEST	POST TEST	PRE TEST	POST TEST	PRE TEST	POST TEST
1	2	10	9	10	3	6	4	10
2	6	9	6	10	5	7	2	9
3	4	10	2	8	3	5	7	9
4	2	9	5	9	3	9	2	9
5	2	8	2	9	3	4	4	10
6	3	8	5	9	3	9	5	9
7	3	9	0	10	2	6	2	9
8	6	8	4	10	5	6	3	9
9	3	3	2	10	3	10	4	10
10	3	9	2	10	6	9	4	9
11	2	10	3	10	2	10	5	10
12	2	5	4	10	7	9	8	9
13	3	4	3	10	2	9	3	10
14	3	8	6	10	2	9	4	10
15	4	6	2	10	5	6	4	10
16	6	8	3	9	3	10	6	9
17	6	9	4	10	2	10	5	9
18	1	5	3	9	2	10	8	10
19	5	8	4	9	3	10	3	9
20	3	10	3	9	6	10	5	10
21	5	9	4	9	4	6	5	9
22	2	7	7	10	3	9	1	10
23	2	10	5	10	3	10	2	9
24	4	10	3	10	4	10	5	10
25	2	8	6	9	3	7	4	8
26	3	10	5	10	7	9	8	10
27	3	10	3	9	5	10	5	10
28	2	9	4	10	3	9	5	9
29	5	10	6	9	5	8	5	9
30	5	8	4	9	2	8	3	7
31	5	10	3	9	6	9	9	10
32	3	7			4	9	1	6
33	4	9			4	9	8	10
34	5	10			3	8	8	10
35	5	9			6	10	9	10
36	4	8			3	8	2	5
37					4	9	9	10
38					2	7	5	8
39					3	8	7	10
40					5	9	6	8
41					7	10	6	9
42							5	9

The mean gain score of the students was 4.77, computed by subtracting the pre-test mean

from the post-test mean ($8.85 - 4.08$). This indicates that, on average, students improved by 4.77 points after exposure to the storybook-integrated lesson. This substantial gain further supports the effectiveness of the intervention in improving students' conceptual understanding.

The paired-samples t-test yielded a t-value of -28.88 with 149 degrees of freedom and a p-value of less than 0.001, indicating that there is a statistically significant difference between the pre-test and post-test scores. The negative t-value implies that the post-test scores were significantly higher than the pre-test scores. Furthermore, the computed Cohen's d of 2.36 indicates a very large effect size, demonstrating that the improvement in students' conceptual understanding was not only statistically significant but also practically meaningful. These findings provide strong evidence that the storybook-integrated lesson was effective in enhancing students' understanding of the Fundamental Counting Principle.

The results of the present study provided clear and consistent evidence that the storybook-integrated lesson significantly enhanced Grade 8 students' conceptual understanding of the Fundamental Counting Principle. The relatively low pre-test means of 4.08 suggests that, before the intervention, many students struggled to make sense of counting principles in abstract or non-contextualized formats. This aligns with common classroom observations where learners often resort to rote memorization or formula application without truly understanding how and why the Fundamental Counting Principle works in real-life situations.

In contrast, the post-test mean of 8.85 indicates a marked improvement in students' understanding after participating in the storybook-integrated lesson. The dramatic increase in performance, combined with a statistically significant paired-samples t-test ($t=149$) = -28.88 , $p < 0.001$), indicates that the observed gains were unlikely to have occurred by chance. More importantly, the very large effect size (Cohen's $d = 2.36$) suggests that the improvement was not merely a minor fluctuation but a practically meaningful change in students' mathematical thinking. This supports the idea that embedding mathematical concepts within narrative contexts can help learners connect abstract ideas to familiar, human-centered scenarios.

With respect to the research questions, the findings indicate that students' conceptual understanding of the Fundamental Counting Principle was generally low before the intervention, as reflected in the pre-test scores. After the storybook-integrated lesson, their understanding improved significantly, as shown by the higher post-test mean and the highly significant t-test result. The mean gain score of 4.77 further illustrates the extent of improvement, reinforcing the conclusion that the intervention was effective in promoting deeper conceptual understanding. These results suggest that the storybook-integrated approach may serve as a valuable instructional strategy for teaching counting principles in high school mathematics, particularly for topics that students often find abstract or disconnected from everyday experience.

From a classroom perspective, the integration of storybooks likely helped students visualize problems, identify stages in counting processes, and interpret the "why" behind the multiplication of choices. The narrative format may have reduced anxiety and increased engagement, allowing learners to focus on reasoning rather than on memorizing formulas. Future classroom-based action research could explore how different types of stories or contexts influence understanding across other topics in combinatorics and probability, as well as whether the gains observed in this study are sustained over time.

This study aimed to examine the effectiveness of a storybook-integrated lesson in improving Grade 8 students' conceptual understanding of the Fundamental Counting Principle. Results showed that embedding mathematical ideas within meaningful narratives helps students understand and apply abstract concepts better. The study demonstrates that storybook-integrated lessons are an effective approach that enhances students' understanding of mathematics while promoting literacy, highlighting the value of interdisciplinary and engaging teaching strategies in the classroom.

Teachers are encouraged to integrate storybooks into mathematics lessons to make abstract concepts more engaging, meaningful, and relatable. By embedding mathematical ideas within stories, students can better visualize and apply concepts while simultaneously developing literacy skills. Teachers should also facilitate discussions and reflections on the story to deepen students' understanding, encourage critical thinking, and promote problem-solving skills, creating a more interactive and student-centered learning environment.

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Improving Grade 8 and 9 Students' Awareness and Skills in Basic Dance Steps through Gradual Release of Responsibility (GRR) Approach

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Abstract

This classroom-based action research investigates the effectiveness of the Gradual Release of Responsibility (GRR) approach—anchored in demonstration, guided practice, and collaborative learning—in improving Grade 8 and 9 students' awareness and skills in basic dance steps at a city high school. Recognizing that many learners struggle with rhythm, coordination, and confidence due to limited exposure and practice, the study implemented a one-month intervention focusing on cha-cha-cha steps (forward, backward, sideward) through structured stages: teacher modeling (“I do it”), guided practice (“We do it”), collaborative learning (“You do it together”), and independent performance (“You do it alone”). Using pre- and post-assessments, observation checklists, and performance rubrics, the research measured changes in technical accuracy, rhythm consistency, and confidence. Findings demonstrate significant improvement in students' dance performance and awareness, validating the GRR model as an effective pedagogical framework for Physical Education. Beyond skill acquisition, the study contributes to students' physical, cognitive, and social development, while offering evidence-based insights for curriculum enhancement and community-based dance education. Ultimately, this research underscores the value of structured, student-centered approaches in fostering independence, engagement, and appreciation for the performing arts.

Keywords: *Gradual Release of Responsibility (GRR); Demonstration and Guided Practice; Community-Based Action Research (CBAR); Dance Education; Cha-cha-cha Basic Steps; Physical Education; Student-Centered Learning; Grade 8 and 9 Students*

Introduction

Dance, as an essential component of Physical Education, plays a vital role in developing students' physical coordination, rhythm, confidence, and appreciation for the performing arts. However, many learners in the secondary level struggle to master even basic dance steps due to limited exposure, lack of guided practice, and low self-confidence. These challenges often result in disengagement and hinder the holistic development that Physical Education aims to foster.

To address these gaps, this study explores the use of the Gradual Release of Responsibility (GRR) model, integrated with demonstration and guided practice, as a structured framework for teaching dance. The GRR approach emphasizes a systematic shift from teacher-led instruction (“I do it”), to shared practice (“We do it”), to collaborative learning (“You do it together”), and finally to independent performance (“You do it alone”). This model ensures that the students’ progress from observation to mastery with increasing autonomy, thereby promoting both skill acquisition and learner independence.

The focus of this research is Grade 8 and 9 students in a city high school, who underwent a one-month intervention centered on basic cha-cha-cha steps such as forward, backward, and sideward movements. Through pre-assessment and post-assessment activities, observation checklists, and performance rubrics, the study described improvements in technical accuracy, rhythm consistency, and confidence.

Ultimately, this research sought to contribute to the enhancement of Physical Education instruction by providing evidence-based strategies that foster student-centered learning. It also underscored the importance of structured teaching approaches in cultivating not only dance skills but also discipline, teamwork, and appreciation for cultural and artistic expression.

The teaching of dance in Physical Education has long been recognized as a means of fostering students’ physical, cognitive, and socio-emotional development. However, many learners encounter difficulties in mastering basic dance steps due to limited exposure, lack of confidence, and insufficient guided practice. To address these challenges, scholars have emphasized structured instructional frameworks that gradually build student autonomy.

Fisher and Frey (2008, 2013) introduced the Gradual Release of Responsibility (GRR) model, which shifts the cognitive load from teacher-led instruction (“I do it”) to guided practice (“We do it”), collaborative learning (“You do it together”), and independent performance (“You do it alone”). This model has been widely applied in literacy and content-area instruction, demonstrating its effectiveness in promoting independent learning and skill mastery. Bennett (2025) further highlighted that GRR fosters self-regulated learners capable of applying knowledge beyond the classroom.

Vygotsky’s (1978) theory of the Zone of Proximal Development (ZPD) provides a theoretical foundation for GRR, emphasizing the importance of scaffolding and social interaction in skill acquisition. Through teacher modeling and peer collaboration, learners gradually internalize skills and perform independently. This aligns with dance education, where rhythm, coordination, and confidence are developed progressively through structured practice.

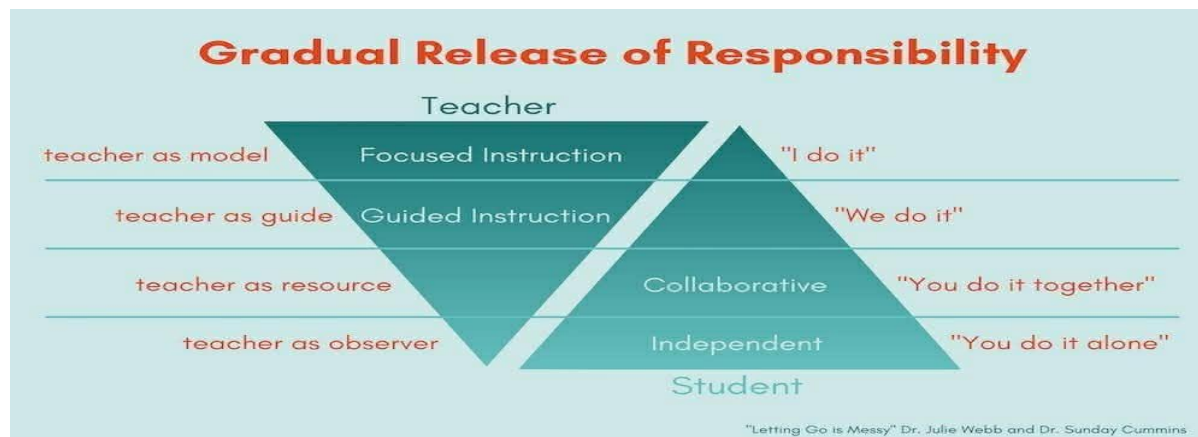
Some researches underscore the role of demonstration and guided practice in skill acquisition. Duke and Pearson (2002) emphasized that modeling and practice enhance comprehension and performance, while Hutchison (2019) and Siemens (2018) highlighted the importance of accessibility and interactivity in modern classrooms. In the context of Physical Education, demonstration provides clarity of movement, guided practice ensures repetition with feedback, and collaborative learning fosters teamwork and confidence.

Moreover, studies on dance pedagogy reveal that structured approaches improve not only technical skills but also students' appreciation of cultural and artistic expression. Johnson (2019) noted that adaptive learning strategies enhance student performance, while Varthana (2024) emphasized the effectiveness of visual aids in teaching complex skills such as dance steps. Taken together, these studies support the integration of GRR with demonstration and guided practice in dance education. By combining theoretical foundations with practical strategies, educators can create engaging, student-centered environments that promote mastery, independence, and lifelong appreciation for the performing arts.

This study was guided by the following research questions: What is the demographic profile of the Grade 8 and 9 student respondents in terms of name, year and section, age, and gender? What is the current level of skill of Grade 8 and 9 students in performing basic dance steps? How accurately can students perform the basic steps taught in class? How consistent are students in executing rhythm, timing, and coordination during dance routines? What common errors or difficulties do students encounter when performing basic dance steps? What challenges do students encounter in learning basic dance steps, and in what ways can demonstration and guided practice address these challenges? How effective is the Gradual Release of Responsibility (GRR) approach in enhancing students' independent learning and mastery of basic dance steps?

Figure 1

The Gradual Release of Responsibility (GRR) Model



This study was anchored on the Gradual Release of Responsibility (GRR) model, which provides a structured pedagogical framework for guiding learners from teacher-directed instruction toward independent mastery. The GRR model emphasizes four interconnected stages: focused instruction (“I do it”), guided practice (“We do it”), collaborative learning (“You do it together”), and independent performance (“You do it alone”). Through this progression, responsibility for learning gradually shifts from the teacher to the students, enabling learners to build confidence, autonomy, and technical competence.

In the context of dance education, the GRR framework ensures that students first observe and internalize movements through teacher demonstration, then engage in guided practice with feedback, collaborate with peers to refine rhythm and coordination, and ultimately perform independently with confidence. This systematic approach aligns with Vygotsky’s (1978) theory of scaffolding within the Zone of Proximal Development, where learners acquire skills through structured support before achieving independent performance.

By applying the GRR model to the teaching of basic cha-cha-cha steps, this study seeks to enhance students’ awareness, rhythm, and coordination while fostering self-regulated learning. The conceptual framework illustrates how instructional responsibility is gradually released, ensuring that learners progress from observation to mastery in a supportive and student-centered environment.

Methodology

This study employed a qualitative-descriptive Classroom-Based Action Research (CBAR) framework to enhance Grade 8 and 9 students’ awareness and skills in basic dance steps. The design followed the action research cycle: planning, acting, observing, and reflecting (Kemmis & McTaggart, 1988).

Planning Phase. Identification of challenges faced by students in learning dance steps and preparation of instructional strategies anchored on the Gradual Release of Responsibility (GRR) model.

Acting Phase. Implementation of structured dance lessons through four stages: teacher modeling (“I do it”), guided practice (“We do it”), collaborative learning (“You do it together”), and independent performance (“You do it alone”).

Observing Phase. Collection of data through classroom observations, performance rubrics, reflective journals, and checklists to monitor student progress.

Reflecting Phase. Analysis of data to evaluate the effectiveness of the intervention and identify areas for improvements

The participants were Grade 8 and 9 students of a city national high school in northern part of Luzon, selected through purposive sampling. Demographic data such as age, gender, year, and

section were recorded to contextualize findings. To gather data, the study made use of structured questionnaire, observation checklist and rubrics and pre-test and post-test assessments. Data were analyzed using descriptive statistics (mean, standard deviation) to summarize performance levels. A paired sample t-test was conducted to determine significant differences between pre-test and post-test scores, with a significance level set at 0.05.

Results and Discussion

The respondents represented diverse age groups and sections, with balanced gender distribution, ensuring inclusivity in the study. Initial assessments revealed limited awareness of dance terminology and frequent errors in rhythm, timing, and coordination. Many students expressed low confidence in performing steps independently. After the intervention, students demonstrated significant improvement in technical accuracy, rhythm consistency, and confidence. The paired sample t-test showed a $p\text{-value} < 0.05$, indicating a statistically significant difference between pre-test and post-test scores. Common difficulties included hesitation in movement execution, lack of synchronization, and self-consciousness during peer performance. These were gradually reduced through guided practice and collaborative learning.

The findings confirm that the Gradual Release of Responsibility (GRR) approach is an effective instructional framework for teaching basic dance steps. Teacher demonstration provided clarity of movement, guided practice allowed repetition with feedback, and collaborative learning fostered teamwork and confidence. By the independent stage, students exhibited autonomy and mastery of cha-cha-cha steps. These results are consistent with Vygotsky's (1978) Zone of Proximal Development, which emphasizes scaffolding and social interaction in skill acquisition. The structured release of responsibility enabled students to transition from dependence on teacher modeling to independent performance.

Furthermore, the outcomes align with Fisher and Frey's (2008, 2013) assertion that GRR promotes independent learners capable of applying skills beyond the classroom. In the context of Physical Education, this approach not only improved technical dance skills but also enhanced students' discipline, teamwork, and appreciation for cultural expression. The study also highlights the broader impact of dance education on students' holistic development. Beyond physical coordination, learners gained confidence, social responsibility, and a deeper appreciation for the performing arts. This underscores the importance of integrating structured, student-centered approaches in Physical Education to foster lifelong learning and engagement.

This study was limited to Grade 8 and 9 students of a city national high school, which may restrict the generalizability of findings to other grade levels or schools. The intervention focused only on basic cha-cha-cha steps (forward, backward, sideward), excluding other dance genres that could provide broader insights. Time constraints also limited the intervention to a one-month period, which may not fully capture long-term retention or mastery. Additionally, students'

varying levels of prior exposure to dance and differences in confidence may have influenced performance outcomes.

The study deliberately concentrated on the application of the Gradual Release of Responsibility (GRR) model in dance education, specifically targeting cha-cha-cha steps. It was designed to measure awareness, rhythm, coordination, and confidence, rather than advanced choreography or cultural dance forms. The scope was confined to classroom-based interventions, excluding extracurricular or community dance activities.

The findings of this study demonstrate that the Gradual Release of Responsibility (GRR) approach, integrated with demonstration and guided practice, significantly improved Grade 8 and 9 students' awareness and skills in basic dance steps. Students progressed from limited confidence and frequent errors in rhythm and coordination to greater accuracy, consistency, and independence in performance. The structured shift from teacher-led instruction to student autonomy proved effective in fostering technical mastery, self-confidence, and collaborative learning. This research validates the GRR model as a practical and evidence-based framework for Physical Education, aligning with theories of scaffolding and student-centered learning. Beyond technical skill acquisition, the intervention contributed to students' holistic development, enhancing discipline, teamwork, and appreciation for the performing arts.

To maximize the educational outcomes of physical education programs, it is recommended that instructors integrate the Gradual Release of Responsibility (GRR) model alongside systematic demonstrations, guided practice, and structured rubrics to enhance student confidence and systematically track performance progression. Furthermore, curriculum developers should incorporate structured modules emphasizing progressive skill development and diverse dance genres to foster cultural inclusivity and student-centered learning environments. To validate and extend these findings, future researchers ought to replicate this study across varied academic tiers, initiate longitudinal inquiries into skill retention, and investigate the integration of interactive technologies like video modeling. Ultimately, students must actively engage in collaborative practices to optimize rhythm and coordination, while leveraging these acquired capabilities outside formal education to support lifelong physical wellness and creative self-expression.

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Reigniting the Joy of Reading: An Action Research on Reviving Reading Habits in the Age of Aliteracy Through Literature Circle

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Abstract

Despite basic literacy efforts in the Philippines, high school students consistently face low reading comprehension and rising aliteracy—the state where capable readers lack the motivation to read voluntarily. Traditional classroom practices, digital distractions, and a lack of engaging materials further worsen this issue, producing functionally illiterate students who struggle to think critically. This action research evaluates the implementation of literature circles, a student-centered and collaborative reading approach grounded in Self-Determination Theory, to enhance reading engagement among Grade 10 English students. The study aims to achieve three specific purposes: determine students' initial reading levels using the Philippine Informal Reading Inventory (Phil-IRI) and classroom observations; identify key factors driving their lack of interest, such as digital distractions and unstimulating environments; and improve overall engagement through peer-led, reflective literature circles centered on local narratives. By fostering autonomy, competence, and relatedness, this intervention transforms reading from a passive task into an active, culturally grounded dialogue. Ultimately, the findings offer valuable evidence-based insights for learners, educators, communities, and future researchers seeking sustainable, practical strategies to combat aliteracy and nurture motivated, critical readers in similar educational contexts.

Keywords: *aliteracy, Literature Circle, reading comprehension reading habits*

Introduction

In any educational system, the ability to read is often seen as a fundamental measure of learning, a skill that enables students to access knowledge, interpret ideas, and participate in society. For years, efforts in the Philippines have focused on improving literacy rates, ensuring that students acquire the basic ability to decode and recognize written texts. However, recent studies suggest that this focus may no longer be sufficient. While many Filipino students are considered literate in the traditional sense, a growing number struggle to understand, analyze, and apply what they read. This gap is reflected in international assessments such as the Programme for International Student Assessment (PISA), where Filipino high school students ranked among the lowest in reading comprehension (Haw et al., 2021).

Beneath these alarming statistics lies a subtler, yet equally urgent problem: *aliteracy*. Many students, while capable of reading, choose not to engage with texts voluntarily which limits their exposure to ideas and reduces opportunities to practice comprehension (Ferrerias & Astillero, 2025; Galiza, 2022; Magsalin, 2023). This disengagement is reinforced by classroom practices that prioritize rote memorization and exam preparation over exploration, the lack of culturally relevant or stimulating reading materials, and the constant lure of digital media that rewards speed and

passivity over reflection and thoughtfulness (Galpo et al., 2026; Gerona, 2025). As a result, a vicious cycle emerges: students read less, comprehend less, and lose the motivation to read, further entrenching aliteracy and eroding critical thinking skills.

In response, the Department of Education has introduced several interventions aimed at addressing both literacy gaps and reading disengagement. Programs such as *Balik-Aral*, the *ARAL Program*, and *Catch-Up Friday* have been implemented in high schools to provide structured reading support, remedial instruction, and enrichment opportunities for struggling learners (Abejo & Malatag, 2024; Ganohay et al, 2025; LaBad, 2024). These initiatives focus on comprehension development, critical thinking, and fostering a positive reading experience. Early evidence indicates improvements in engagement and student confidence, yet measurable gains in standardized reading performance remain inconsistent (Balbin et al., 2024; Capuyan-Castrodes & Ibojo, 2025).

Despite these efforts, functional illiteracy remains a critical concern in the Philippines. Studies indicate that a significant proportion of high school students, while technically literate, struggle to apply reading skills in academic and real-world contexts. For instance, research on senior high school students revealed persistent difficulties in reading comprehension, particularly in core subjects such as science and social studies, even among those who had successfully completed basic literacy programs (Cabural & Infantado, 2023; Caraig & Quimbo, 2022). Similarly, a school-based Philippine Informal Reading Inventory (Phil-IRI) study found that many learners aged 17–18 performed below proficiency in Filipino reading comprehension, highlighting the gap between decoding ability and functional literacy (Balisoro et al., 2025).

These findings, while alarming on paper, are mirrored in classrooms. Observations during immersion in Grade 10 English classes revealed persistent disengagement and superficial comprehension, underscoring that many students can technically read but remain disconnected from the meaning and purpose of texts. Without fostering motivation and voluntary reading habits, even well-designed interventions risk producing learners who are literate in form but aliterate in practice—unable to think critically, engage deeply, or apply their reading to real-world contexts (Gonio & Bauyot, 2025; Ortega-Dela Cruz, 2026).

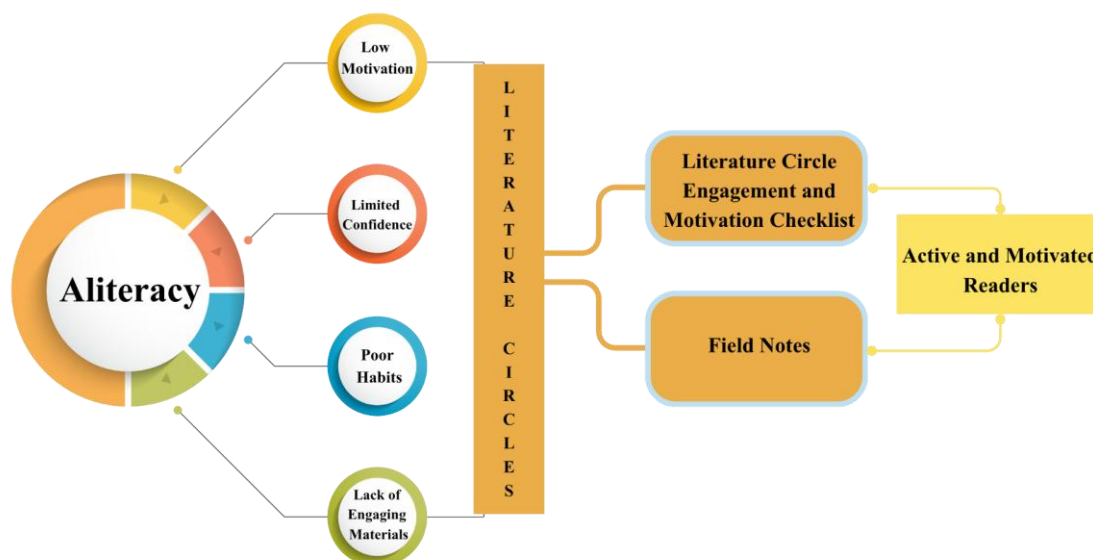
To address persistent reading disengagement among Filipino high school students, this study implements literature circles, a collaborative, student-centered approach that transforms reading from a passive task into an interactive, reflective experience. Unlike traditional methods focused on rote memorization or worksheets, literature circles encourage critical reading, meaningful discussion, and active ownership of learning (Daniels, 2002; Harvey & Goudvis, 2007; Gallardo, 2023). Drawing on self-determination theory (Deci & Ryan, 2000), this approach nurtures intrinsic motivation by satisfying students' needs for autonomy, competence, and relatedness: they choose reading roles, engage with peers in meaningful dialogue, and are challenged to interpret and apply ideas creatively. Literature circles support these needs by giving students control over reading roles, promoting meaningful peer interaction, and challenging them to apply their understanding creatively. As a result, students are not only practicing literacy skills but are also developing the motivation to read for pleasure and personal growth which address the core issue of aliteracy. By centering on local narratives, the intervention cultivates motivated,

culturally grounded readers who read not only to decode but to think deeply, question critically, and create meaning that connects them to their world and community.

From the observed situation of English classes of Grade 10 students, the researchers share the same goal of this action research to achieve the following purposes: 1) to determine the reading level of students using classroom observations and the Philippine Informal Reading Inventory (Phil-IRI) assessment; 2) to identify the factors contributing to students' lack of interest in reading, particularly in terms of reading materials, digital distractions, and reading environment; and to enhance students' reading engagement through the implementation of Literature Circles. This action research holds significance in several areas as it addresses the reading engagement of students while providing meaningful insights for learners, teachers, community, future researchers, and in education research context.

Figure 1

The Conceptual Framework



This study is grounded in the concept of aliteracy, defined as a condition in which individuals possess the ability to read but demonstrate a lack of motivation or interest in engaging with texts (Magsalin, 2023). Contemporary literacy research emphasizes that reading difficulties are not solely cognitive but are strongly influenced by affective and environmental factors, particularly motivation, engagement, and self-efficacy (Guthrie et al., 2014). Thus, this framework assumes that students' disengagement from reading is primarily shaped by motivational and contextual variables rather than by an inability to read.

To address these challenges, this study employs Literature Circles as the central instructional intervention. Literature Circles are grounded in social constructivist theory and are highly compatible with Self-Determination Theory principles. This approach promotes autonomy

by allowing students to select reading materials and assume roles; enhances competence through structured yet supportive peer discussions; and fosters relatedness by encouraging collaborative interaction and shared meaning-making. Research demonstrates that Literature Circles significantly improve students' reading motivation, engagement, and self-efficacy, particularly among reluctant readers (Khonamri et al., 2024; Talenta & Himawati, 2023; Venegas, 2018).

In this approach, students assume specific roles, participate in collaborative discussions, and are often given choices in reading materials, thereby promoting ownership of learning and deeper comprehension. Empirical evidence further demonstrates that Literature Circles significantly enhance reader self-efficacy, motivation, and enjoyment, particularly among reluctant and struggling readers (Venegas, 2018).

The expected outcome is the development of active, motivated, and engaged readers. Through addressing the underlying causes of aliteracy, the framework posits that students will demonstrate increased participation, improved reading confidence, and more consistent reading habits. At large, this study contributes to the field of literacy education by aligning classroom-based observations with evidence-based practices that promote meaningful and sustained reading engagement.

This action research examined the reading engagement of three Grade 10 students at a national high school in Isabela through the implementation of Literature Circles in their English class. Utilizing classroom observations and the Philippine Informal Reading Inventory (Phil-IRI), the study assessed students' reading levels and identified critical barriers to reading interest, such as digital distractions, unstimulating learning environments, and the nature of available materials. It then described the effectiveness of structured Literature Circles—including collaborative discussions, assigned roles, and guided reading sessions—in improving student participation, motivation, and interactive comprehension within the boundaries of the classroom.

However, the study faced key limitations, particularly its short intervention timeframe, which may not fully capture long-term behavioral changes or sustained reading motivation. Data collection relied heavily on the Phil-IRI, field notes, and a Literature Circle Engagement and Motivation Checklist, introducing potential subjectivity in behavioral interpretation. Furthermore, external variables such as students' unique learning styles, prior literacy experiences, and the level of parental support at home remained outside the researcher's control. Despite these constraints, the study provided valuable, classroom-based insights into utilizing collaborative learning to combat aliteracy and foster meaningful text engagement.

Methodology

This study employed a Classroom-Based Action Research (CBAR) design to address the issue of aliteracy among three selected Grade 10 students at a national public secondary school in Isabela during the School Year 2025–2026. Grounded in Kemmis and McTaggart's 1988 model, this systematic, cyclical approach allowed the researchers to plan, act, observe, and reflect on an

instructional intervention within the actual classroom setting in real time. Using purposive sampling, three students were selected because they demonstrated clear signs of aliteracy, such as minimal engagement in reading-related activities, low reading motivation, and limited voluntary text interaction despite possessing basic decoding skills.

To assess reading levels and diagnose comprehension difficulties, the study utilized the Philippine Informal Reading Inventory (Phil-IRI) as a baseline diagnostic tool. The intervention centered on three Philippine short stories—*Footnote to Youth*, *How My Brother Leon Brought Home a Wife*, and *Dead Stars*—to foster deep critical thinking and authentic engagement. Data collection relied on a structured checklist adapted from Guthrie and Wigfield's framework to track observable behaviors like cooperation and role responsiveness, alongside detailed researcher field notes. Together, these quantitative and qualitative instruments ensured data triangulation, which significantly enhanced the overall validity and reliability of the research findings.

The data collection procedure spanned an eight-week period structured around the four phases of action research. During the planning phase, official administrative permissions were secured and the Phil-IRI was administered to establish baseline literacy levels, which subsequently guided the choice of texts and the design of the research instruments. In the acting phase, the intervention was integrated into the weekly English class every Friday; the first two weeks served as a preliminary observation period, followed by four weeks of structured Literature Circle sessions where students executed specific reading roles. The final two weeks constituted the observing and post-intervention phases, where researchers utilized the structured checklist and field notes to monitor changes in student behavior, ultimately feeding into the reflecting phase where pre- and post-intervention data were analyzed to evaluate the strategy's effectiveness.

Following the data collection process, the gathered information was systematically organized and analyzed using complementary quantitative and qualitative procedures. Quantitative scores from the Phil-IRI and high-rated items from the Motivations for Reading Questionnaire (MRQ) were tabulated to measure explicit shifts in performance and intrinsic drive. Concurrently, qualitative data from classroom observations, checklists, and field notes underwent thematic analysis following Braun and Clarke's (2022) framework to isolate recurring patterns in student interaction and voluntary participation. Throughout this entire methodology, strict ethical standards were maintained; informed parental consent and student assent were secured for the minor participants, and full anonymity was guaranteed by omitting all personal identities from the final report.

Participants were informed of their right to withdraw from the study at any point without any penalty or negative consequences. Their participation or non-participation did not affect their academic standing or grades in the subject. Furthermore, the researchers ensured that the activities conducted during the intervention posed no harm to the students. The Literature Circle strategy was implemented as part of regular classroom instruction, making it safe, appropriate, and beneficial for the learners' academic development.

All data collected were used solely for academic purposes and were stored securely to prevent unauthorized access. After the completion of the study, all records would be properly disposed of or archived in accordance with research guidelines.

Results and Discussions

Preliminary classroom observations were conducted over two consecutive days to assess reading engagement among a class of 32 Grade 10 students. Three students consistently exhibited minimal participation and low engagement, which met the study's inclusion criteria. One student remained completely silent despite teacher prompts, the second actively avoided eye contact and ignored reading tasks, and the third provided only short, undeveloped responses during discussions. Based on these persistent behaviors, these three individuals were selected as the primary participants for the action research intervention.

Informal follow-up conversations with the selected participants revealed specific factors driving their aliteracy and disengagement. Student 1 struggled to connect with the text, stating, *"The stories are not interesting to me, and sometimes I don't understand why we read them."* Student 2 emphasized the constant draw of digital distractions, explaining, *"I usually spend more time on my phone, so reading feels boring and takes too long."* Meanwhile, Student 3 pointed to the classroom environment as a barrier, noting, *"It's hard to focus when it's noisy, and I don't always feel comfortable sharing my ideas."*

These responses demonstrate that student disengagement is complexly shaped by unstimulating materials, digital habits, and environmental comfort rather than reading capability alone. These findings align with educational literature showing that low classroom participation often reflects deeply diminished reading motivation, highlighting the necessity of targeted, collaborative interventions to effectively improve student literacy skills (Guthrie et al., 2020).

Table 1 presents the pre-intervention Phil-IRI results. The data indicate that all three students were at the frustration level, reflecting difficulty in independently comprehending texts across literal, inferential, and critical domains.

Table 1
Phil-IRI Pre-Intervention Results

Student	Literal	Inferential	Critical	Total Score	Reading Level
Student A	1	4	3	8	Frustration
Student B	1	2	3	6	Frustration
Student C	4	2	3	9	Frustration

The results show that Student B struggled the most, while Student C performed slightly better in literal comprehension. These findings align with research indicating that many secondary learners face challenges in inferential and critical comprehension, which are

essential for higher-order understanding (Amendum et al., 2018). Learners at this level also tend to exhibit low reading motivation, likely due to repeated difficulty with texts (Guthrie et al., 2020).

Accordingly, analysis of the Motivations for Reading Questionnaire (MRQ) and classroom observations indicated that the students' low reading proficiency was accompanied by low engagement and motivation. Students rarely volunteered answers, avoided participating in discussions, and showed little interest in challenging texts. Specifically: Student A was hesitant to contribute and required frequent prompts to complete tasks. Student B disengaged from group activities and participated minimally in collaborative tasks. Student C, despite slightly higher literal comprehension, participated inconsistently and showed limited self-directed reading.

These findings highlight a clear link between reading ability and engagement, suggesting that students' struggles with comprehension contribute to reduced motivation and participation. The results underscore the need for targeted interventions that simultaneously address reading skills and engagement strategies to foster intrinsic motivation and collaborative learning (Guthrie et al., 2020).

Figure 2

Engagement Level Across Literature Circles Sessions

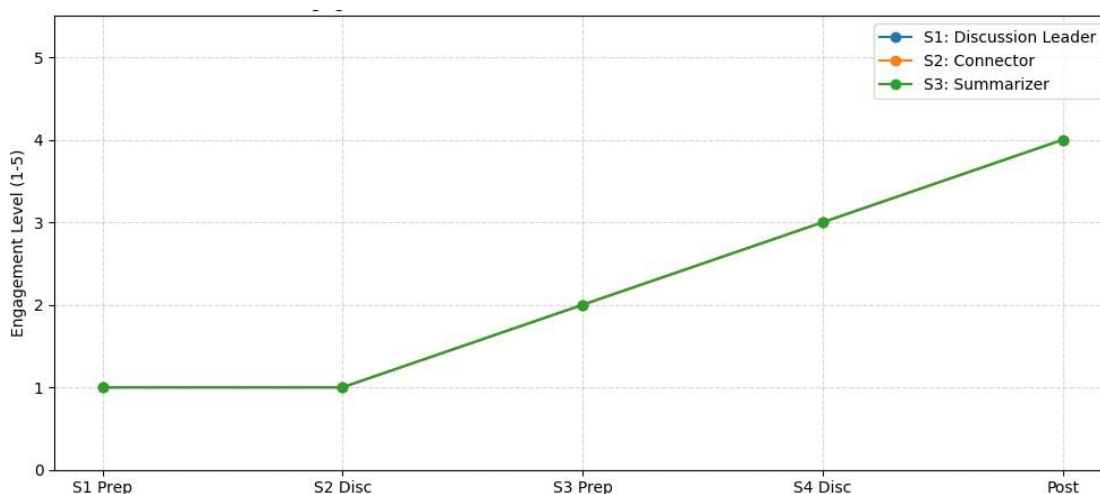


Figure 2 illustrates the engagement levels of the participants across the four Literature Circle sessions and the post-intervention phase. The data reveal a steady upward trend, with engagement increasing from Level 1 (low engagement) in the initial sessions to Level 4 (moderate engagement) in the final phase.

During the first two sessions, students demonstrated low initial engagement and passive learning behaviors associated with aliteracy. In Session 1, S1 failed to initiate discussion, S2 showed little interest, and S3 produced underdeveloped notes, aligning with observations by Guthrie et al. (2015) that low reading engagement is characterized by limited effort, low

motivation, and minimal text interaction when structured strategies are missing. Session 2 yielded only slight improvements, as participation remained passive with short, prompted responses; this supports findings by Fisher et al. (2016), who noted that students initially struggle and provide surface-level responses in collaborative discussions due to a lack of familiarity with roles and expectations.

A positive shift occurred during the final two sessions as the students grew accustomed to the intervention framework. In Session 3, students became noticeably more attentive, with S2 identifying relevant ideas and S3 organizing notes more effectively—a development that aligns with Vygotsky's Social Constructivist Theory and recent work by Gillies (2016) emphasizing that structured group work helps students internalize collaborative processes and become active participants. By Session 4, advanced progress was evident as S1 initiated guiding questions, S2 contributed text-based connections, and S3 delivered a structured summary, matching Level 3 engagement.

In the post-intervention phase, students demonstrated the highest level of engagement. S1 actively facilitated discussion, S2 made more relevant and frequent connections, and S3 produced clearer and more coherent summaries. Participation became more balanced and interactive. These findings are consistent with Alvermann et al. (2017) who emphasized that collaborative literacy practices, such as Literature Circles, significantly enhance comprehension, motivation, and student interaction when implemented over time.

After four weeks of Literature Circle implementation, participants showed substantial improvement, progressing from the frustration to the instructional level, indicating enhanced reading proficiency. (See Table 2.)

Table 2
Phil-IRI Post-Intervention Results

Student	Literal	Inferential	Critical	Total Score	Reading Level
Student A	8	8	10	26	Instructional
Student B	7	9	6	22	Instructional
Student C	8	10	6	24	Instructional

An analysis of the post-intervention Motivations for Reading Questionnaire (MRQ) data revealed a substantial quantitative increase in reading engagement and intrinsic drive across all three participants. Specifically, Student A's high-rated items escalated from 10 to 28, Student B's from 8 to 26, and Student C's from 12 to 30. These statistical metrics were corroborated by empirical classroom observations confirming greater voluntary participation, collaborative

discussion, and self-directed reading, aligning with research showing that Literature Circle and structured collaborative reading interventions enhance intrinsic motivation, engagement, and peer interaction (Al-Qahtani & Lin, 2016; Brugar et al., 2018; Murnan et al., 2023; & Wei, 2025). This notable shift from initial passivity to proactive textual interaction was captured through three mutually reinforcing themes: Active Participation, Collaborative Interaction, and Intrinsic Motivation.

In early sessions, the participants heavily relied on external prompts, exhibited minimal back-and-forth dialogue, and produced brief, undeveloped responses. However, by the final session, students consistently bypassed external prompts to independently volunteer text-based insights, clarify peer perspectives, and execute mutual cognitive scaffolding. Observations indicated that students increasingly volunteered answers, summarized content, and made personal connections as sessions progressed, consistent with research emphasizing that active participation enhances literacy engagement and comprehension. Furthermore, these peer-focused behaviors and balanced contributions align with Vygotsky's (1978) Social Constructivist Theory, which posits that social engagement enhances learning and comprehension, while their post-intervention independent interpretation of challenging passages supports prior studies showing that structured, interactive literacy activities strengthen intrinsic motivation (Guthrie et al., 2020).

The synthesis of these thematic and quantitative findings proves that the Literature Circle intervention successfully mitigated passive reading behaviors associated with aliteracy by promoting accountability, interaction, and active meaning-making. Active participation frequently prompted collaborative discussion, which, in turn, fostered intrinsic motivation to create a dynamic, interconnected process of student literacy development. However, while behavioral and affective engagement improved significantly, the depth of the students' responses and critical analysis remained moderate. This nuance indicates that while collaborative reading interventions are highly efficient in scaffolding immediate engagement, the cultivation of higher-order thinking and deep analytical skills requires a more prolonged and longitudinally sustained implementation of collaborative reading strategies (Amalia, 2025).

In summary, study evaluated the impact of Literature Circles on the reading engagement and comprehension of three Grade 10 students exhibiting signs of aliteracy at a national high school during the School Year 2025–2026. Pre-intervention diagnostic data placed all participants at the frustration level, characterized by passive classroom participation, low intrinsic motivation, and weak inferential comprehension. Following a four-week role-based intervention using culturally relevant texts, all three students successfully progressed to the instructional reading level, demonstrating marked improvements across literal, inferential, and critical domains, alongside heightened peer collaboration and active text engagement.

These outcomes demonstrate that Literature Circles are highly effective in addressing secondary-level aliteracy by reinforcing the vital connection between peer collaboration and text comprehension. However, because the participants' higher-order critical analysis skills remained moderate by the end of the study, a prolonged and sustained implementation is necessary to cultivate deeper textual evaluation. It is recommended that educators integrate this student-centered strategy with explicit role scaffolding, that students actively embrace these collaborative

habits for personal growth, and that future researchers expand on this study by examining larger student samples and incorporating digital or multimodal literacy resources.

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KADUYAN (*Kawayang Dunong Tungo sa Pangkabuhayan*): An Indigenous Game-Based Learning Approach in Teaching Grade 9 Araling Panlipunan (Economics)

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Abstract

This classroom-based action research examined the effectiveness of KADUYAN (*Kawayang Dunong Tungo sa Pangkabuhayan*), an indigenous game-based learning approach using bamboo-based materials, in enhancing the engagement of Grade 9 students in Economics at a public high school. Using a quantitative descriptive design, the study utilized pre- and post-engagement surveys and classroom observations to measure changes in students' affective, behavioral, and cognitive engagement. Findings revealed a significant improvement across all domains after the implementation of KADUYAN. Results showed increased interest and motivation (affective), enhanced collaboration and participation (behavioral), and improved comprehension of economic concepts (cognitive). The increase in weighted mean scores indicates that KADUYAN created a highly interactive and contextualized learning environment. The study concludes that integrating localized, game-based materials like KADUYAN is an effective and sustainable strategy for promoting active learning. It is recommended that educators adopt similar innovative and indigenous instructional materials to enhance student engagement and make lessons more culturally relevant in *Araling Panlipunan*.

Keywords: *economics, indigenous game-based learning, intervention*

Introduction

Game-based learning has emerged as an effective instructional approach in promoting active student participation and deeper understanding of classroom lessons. It shifted teaching from a teacher-centered process to a learner-centered experience, where students actively engaged in activities rather than merely receiving information. According to Grace (2019), game-based learning increased motivation and engagement by allowing learners to explore and apply concepts in meaningful and enjoyable ways. Related studies by Kula (2021) and Syafii (2021) further emphasized that educational games supported the development of critical thinking, collaboration, and problem-solving skills, which are essential in today's learning environment. When play was integrated into instruction, learners became more involved, resulting in improved classroom engagement and learning outcomes.

In Grade 9 Araling Panlipunan (Economics), many learners struggle to sustain interest due to the abstract and complex nature of economic concepts. Traditional lecture-based methods often cause students to become passive, unmotivated, and disconnected from real-life applications, with research indicating that up to 67% of students learn ineffectively through lecturing alone (Goffe & Kauper, 2014; Kozanitis & Nenciovici, 2023). Effect of active learning versus traditional lecturing on the learning achievement of college students in humanities and social To address low classroom engagement observed at a national high school in Isabela, the researchers introduced *KADUYAN: Kawayang Dunong Tungo sa Pangkabuhayan*—an innovative, indigenous game-based instructional intervention designed to transform dry economic lessons into participatory, hands-on, and memorable learning experiences.

This classroom-based action research is theoretically anchored in the foundational frameworks of Jean Piaget and Lev Vygotsky, who both argued that deep comprehension stems from active and social learning. According to Piaget (1962), learners dynamically construct knowledge by physically interacting with their environment, while Vygotsky (1978) emphasized that intellectual development is fundamentally shaped by social interaction and cultural context. The *KADUYAN* framework directly operationalizes these theories by utilizing sustainable, bamboo-made instructional materials that allow a diverse population of students to explore economic theories through experiential games, peer collaboration, and guided discussions.

Furthermore, the study directly aligns with the Department of Education's mandates for contextualized and localized instruction under the K to 12 Curriculum (DepEd, 2016), as well as the learner-centered goals of the current MATATAG Curriculum. By utilizing locally available and eco-friendly bamboo, *KADUYAN* celebrates Filipino resourcefulness, environmental awareness, and cultural ingenuity. This localized pedagogical approach falls under Area 1: Content Knowledge, Pedagogy, and Learning Environment, demonstrating that high-quality, inclusive, and culturally grounded instruction can be seamlessly achieved without relying on expensive or technology-dependent classroom resources.

Finally, this study strongly supports the institutional research priorities of the Philippine Normal University (PNU), particularly within its Basic Education System research agenda. By focusing on the intersections of Curriculum Design and Management, Pedagogical Innovations, and Nurturing Learners, the *KADUYAN* framework serves as a scalable model for modern basic education. It proves that departing from traditional, one-way lecturing in favor of a contextually relevant, eco-friendly educational game successfully nurtures essential 21st-century skills—such as critical thinking, collaboration, and creativity—among contemporary Filipino learners.

This research also aligns with PNU's mission of nurturing diverse learners by addressing varying learning styles and promoting inclusive classroom participation. Economics is often perceived as an abstract and complex subject, which may result in low student engagement. Through the use of *KADUYAN* as a bamboo-based game learning material, students are provided with a multisensory and participatory learning experience that caters to visual, kinesthetic, and interpersonal learning preferences. This approach helps learners develop essential life skills such as cooperation, problem-solving, and decision-making, contributing to their holistic development.

The study also encourages learners to value environmental sustainability and cultural appreciation, consistent with PNU's mission to produce responsible, socially aware, and globally competitive learners.

In terms of Curriculum Design and Management, the research supports the continuous enrichment of the K to 12 Araling Panlipunan curriculum, particularly in Economics. The integration of game-based and localized learning materials through KADUYAN ensures that lessons are meaningful, contextualized, and relevant to students' lived experiences. By bridging theoretical knowledge and real-life applications, the study aligns with the Department of Education's advocacy for contextualized instruction and PNU's commitment to curriculum innovation that promotes creativity, critical thinking, and sustainable practices.

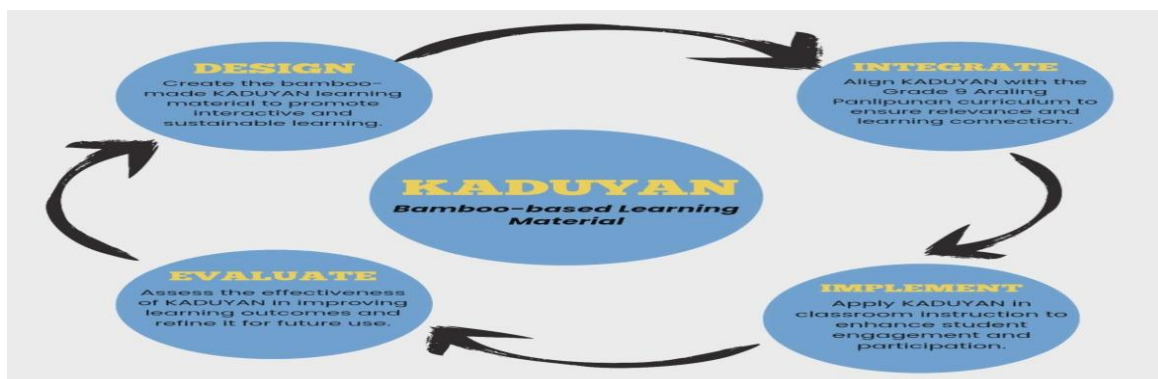
Finally, this study supports PNU's goal of strengthening collaboration among teachers, learners, and community stakeholders. The development and implementation of KADUYAN: *Kawayang Dunong Tungo sa Pangkabuhatan* involves the participation of educators and learners, reflecting a community-based approach to education. This collaboration reinforces the connection between schools and local culture while promoting professional growth and knowledge-sharing among teachers. The results of the study may serve as a model for integrating sustainable and localized learning materials in teaching practice, contributing to the continuous improvement of instruction and teacher professional development in the basic education sector.

In summary, the utilization of bamboo-based game learning materials in teaching Grade 9 Economics embodies the core goals of the Philippine Normal University's research priorities to promote innovative pedagogy, nurture diverse learners, strengthen curriculum design, and foster meaningful educational collaboration. By merging environmental sustainability, cultural relevance, and active learning, this study contributes to the creation of a more inclusive, engaging, and transformative learning environment for Filipino students.

This study aims to explore the utilization of KADUYAN as a bamboo-based game learning material as an innovative teaching strategy to enhance the engagement, participation, and understanding of Grade 9 students in Economics under the subject *Araling Panlipunan*. The study primarily seeks to determine how localized and sustainable materials can be used to make learning more interactive, relevant, and meaningful to students. Specifically, the study seeks to answer the following questions: 1) How does the use of a game-based approach using KADUYAN as a bamboo-made game learning material influence student engagement and participation in learning Economics? 2) What is the impact of KADUYAN on students' comprehension and retention of key economic concepts in *Araling Panlipunan*? 3) How do students perceive and respond to the integration of localized and sustainable learning materials in terms of motivation, interest, and overall learning experience?

Figure 1

Conceptual Framework



This action research adopts a cyclical process composed of four interconnected phases: Design, Integrate, Implement, and Evaluate. Rather than functioning as a linear structure, the framework follows a loop of continuous improvement, where insights from the evaluation phase lead back to the design phase for refinement and enhancement of the KADUYAN learning material. This cyclical nature reflects the reflective and iterative process of action research, emphasizing ongoing development of teaching practices and materials.

Design Phase. This phase involves the conceptualization and initial creation of the KADUYAN bamboo-based game learning material. The material is designed using sustainable and locally available resources such as bamboo, reflecting Filipino creativity and environmental consciousness. The design process prioritizes engagement, collaboration, and durability, ensuring that the material aligns with both pedagogical goals and cultural relevance.

Integrate Phase. Here, the designed material is aligned with the Grade 9 Araling Panlipunan curriculum, specifically within the field of Economics. The integration process ensures that learning competencies are embedded within interactive activities that encourage participation and understanding. This phase focuses on connecting curriculum content with localized, game-based strategies that make abstract concepts more concrete and engaging.

Evaluate Phase. This phase assesses the impact of KADUYAN on student engagement and learning outcomes. Through a comparison of pre- and post-engagement surveys and documented classroom observations, the effectiveness of the material is analyzed. The results from this phase provide insights for the continuous improvement of the KADUYAN learning material, looping the process back to the Design Phase.

The cyclical conceptual framework represents a dynamic and reflective approach to enhancing classroom instruction. By continuously moving through the phases of Design, Integrate, Implement, and Evaluate, the research underscores how innovative, sustainable, and localized game-based materials can continuously evolve to meet the needs of learners and improve

engagement in *Araling Panlipunan*.

Methodology

This study utilized a descriptive Classroom-Based Action Research (CBAR) design by Ivankova (2015) to examine the impact of the game-based learning material *KADUYAN: Kawayang Dunong Tungo sa Pangkabuhayan* on Grade 9 *Araling Panlipunan* (Economics) students. Purposively sampled from an intact class of 30 to 40 students with varied abilities at a national high school in Isabela for Academic Year 2025–2026, the research aimed to improve instructional strategies using real-world data. Prior to implementation, necessary permissions were secured, the material was aligned with curriculum competencies, and the teacher was fully oriented on the research objectives.

The data collection followed a structured three-phase process integrated into the researchers' internship experience over a two- to three-week period. Initially, students completed a researcher-developed, four-point Likert-scale pre-engagement survey evaluating their baseline affective, behavioral, and cognitive engagement. During the intervention, the *KADUYAN* game was integrated into the lessons while researchers conducted structured classroom observations to document real-time behaviors, participation, and attentiveness. Immediately following the intervention phase, a post-engagement survey was administered to track changes across the same engagement metrics.

To derive meaningful insights, both quantitative and qualitative datasets were systematically analyzed and triangulated to provide a comprehensive evaluation. The pre- and post-engagement survey responses were analyzed using descriptive statistics, including frequency, percentage, and weighted means, to precisely measure shifts in student interest, motivation, and comprehension. Concurrently, the qualitative classroom observation data underwent descriptive interpretation to explain, validate, and support the statistical findings, offering a holistic view of student collaboration and instructional efficacy.

This study employed a descriptive research design within a Classroom-Based Action Research (CBAR) framework combined quantitative data from the pre- and post-engagement surveys and qualitative data from classroom observations to provide a comprehensive understanding of the effects of *KADUYAN: Kawayang Dunong Tungo sa Pangkabuhayan* on student engagement, participation, and understanding in Grade 9 *Araling Panlipunan* (Economics).

The quantitative component focused on measuring changes in students' engagement before and after the implementation of *KADUYAN*. The qualitative component described students' observed classroom behaviors, participation, and interaction during the implementation of the game-based activity. This design was appropriate for classroom-based action research as it allowed the researchers to reflect on teaching practices and improve instructional strategies based on actual classroom data.

The participants of the study consisted of Grade 9 students of a national high school in the Province of Isabela during the Academic Year 2025–2026. One intact Grade 9 class of 30-40 students with varied learning abilities and levels of engagement was selected through purposive sampling, as the study focused on improving instruction within an actual classroom setting.

To gather data for the study, a researcher-developed Likert-scale questionnaire was used as the main instrument. It was administered before and after the implementation of KADUYAN to measure changes in students' engagement in Economics. The survey assessed students' affective, behavioral, and cognitive engagement, including their interest, motivation, participation, collaboration, comprehension, and perceived relevance of the lessons. Responses were measured using a four-point Likert scale ranging from Strongly Disagree to Strongly Agree.

Classroom observation was conducted during the implementation of KADUYAN as part of the researchers' internship experience. This was used to document students' actual classroom behavior, including participation, cooperation, attentiveness, interaction during game-based activities, and responsiveness to teacher instructions. The observation served as supporting qualitative data to help explain and validate the findings from the survey results.

Permission was secured from the school principal and the *Araling Panlipunan* teacher prior to the conduct of the study. The research instruments were validated, and the KADUYAN bamboo-based game learning material was prepared and aligned with the Grade 9 Araling Panlipunan (Economics) learning competencies. Orientation was also conducted with the teacher regarding the flow and objectives of the game-based activities.

Before the use of KADUYAN, students were administered a pre-engagement survey to determine their initial level of engagement in Economics lessons. Orientation was also conducted with the teacher regarding the flow and objectives of the game-based activities.

The KADUYAN game-based learning material was integrated into Grade 9 Economics lessons over a period of two to three weeks. Students participated in guided game-based activities, while the teacher facilitated the lesson and observed student engagement, participation, and interaction.

After the completion of the intervention, students answered the post-engagement survey to measure changes in their level of engagement in Economics. Classroom observations were conducted during the implementation of KADUYAN to support and validate the survey results. These observations focused on students' participation, interaction, and attentiveness throughout the game-based activity.

Quantitative data gathered from the pre- and post-engagement surveys were analyzed using descriptive statistics, such as frequency, percentage, and weighted mean, to determine changes in students' engagement before and after the implementation of KADUYAN.

Classroom observation data were analyzed using descriptive interpretation to support and validate the quantitative findings. Observed student behaviors during the implementation were compared with the survey results to provide additional evidence of students' engagement in terms of participation, collaboration, and attentiveness.

In conducting research involving Grade 9 students at a public high school, the researchers upheld the highest ethical standards to ensure the safety, dignity, and well-being of all participants. This study implemented and evaluated KADUYAN: *Kawayang Dunong Tungo sa Pangkabuhayan*. To achieve this, the researchers applied strict ethical procedures emphasizing informed consent, voluntary participation, confidentiality, and cultural sensitivity. Parental consent and student assent were obtained, and all activities took place under the supervision of the cooperating *Araling Panlipunan* teacher. The design and implementation of the learning activity prioritized inclusivity, engagement, and respect for the learners' diverse backgrounds and abilities. By following these ethical guidelines, the researchers promoted a positive, safe, and sustainable learning environment that upheld both educational and community values.

This study prioritized the protection of its vulnerable, school-aged participants by securing informed parental consent and age-appropriate student assent. To guarantee a safe, suitable, and inclusive environment, the researchers closely collaborated with school administrators and the *Araling Panlipunan* teacher. This partnership allowed them to implement the KADUYAN game-based learning material, which was explicitly designed to accommodate diverse learning styles and preferences so that all students could actively participate.

To safeguard participant well-being, the researchers minimized potential emotional risks—such as stress, frustration, or anxiety during observations—by scheduling regular breaks, monitoring behaviors, and adapting game sessions to student needs. Physical safety measures were also strictly followed by researchers when handling bamboo materials. Furthermore, strict confidentiality protocols were enforced; student identities were protected using unique codes, and all data was securely encrypted or locked away before being permanently destroyed after the conduct of the study.

Results and Discussion

The pre-survey and post-survey results focused on the affective, behavioral, and cognitive domains of student engagements in learning *Araling Panlipunan 9* (Economics) are presented here. As shown in Table 1, the pre-survey results indicate that students demonstrated a moderate to high level of affective engagement in Economics. Students agreed that they feel excited and motivated to attend class (WM = 3.13) and strongly agreed that they find the lessons interesting (WM = 3.28).

Table 1

Pre-Survey Results on Affective Engagement

Statement	Weighted Mean	Interpretation
I feel excited and motivated to attend my Economics class every day.	3.13	Agree
I find the lessons and topics in Economics interesting.	3.28	Strongly Agree
I often feel bored or distracted during long lectures and discussions.	2.43	Disagree

However, students disagreed with the statement that they often feel bored or distracted during long lectures (WM = 2.43), suggesting that while boredom is not highly evident, maintaining consistent attention remains a concern. Overall, the findings suggest that students already possess a certain level of interest and motivation, but their engagement may not be fully sustained under traditional teaching approaches.

Classroom observations during regular lecture-based instruction support these findings. It was observed that while students showed initial interest at the beginning of the lesson, some gradually became less attentive as the discussion progressed. A number of students were occasionally distracted or passive, indicating that sustaining focus throughout the lesson remained a challenge under traditional teaching methods.

The post-survey results indicate that students demonstrated a high level of affective engagement after the implementation of KADUYAN. Students strongly agreed that they felt more excited to attend class (WM = 3.68) and that the use of bamboo-based materials made the lesson more interesting (WM = 3.33). They also strongly agreed that they remained focused and attentive throughout the activity (WM = 3.55). These findings suggest that KADUYAN created a more engaging and stimulating learning environment that enhanced students' interest, motivation, and attention during the lesson.

Classroom observations during the implementation of KADUYAN further support these results. Students were observed to be more enthusiastic, attentive, and actively involved in the activities. They showed visible excitement while participating in the game and remained focused throughout the lesson. Compared to the traditional approach, fewer students were distracted, and most were consistently engaged in the task.

Table 2

Post-Survey Results on Affective Engagement

Statement	Weighted Mean	Interpretation
I felt more excited to attend Economics class because of the KADUYAN game.	3.68	Strongly Agree
The use of bamboo materials made the lesson more interesting than a regular lecture.	3.33	Strongly Agree
I remained focused and attentive throughout the entire game-based activity.	3.55	Strongly Agree

A comparison of the pre- and post-survey results reveals a clear and meaningful improvement in students' affective engagement. In the pre-survey, students already expressed agreement in terms of their interest and motivation in learning Economics, indicating that a certain level of engagement was present. However, their responses also suggest that this engagement was not consistently sustained, particularly in maintaining attention during traditional lecture-based instruction.

In contrast, the post-survey results show a shift to strong agreement across all indicators, reflecting a higher level of excitement, interest, and attentiveness. The increase in weighted mean scores indicates that students became more emotionally engaged and focused during the learning process. This improvement may be attributed to the game-based nature of KADUYAN, which created a more interactive and stimulating classroom environment. The use of bamboo-based materials and structured gameplay made the lessons more enjoyable and meaningful, helping capture and sustain students' attention. As a result, students became more motivated and interested in participating in the lesson. These findings indicate that KADUYAN is effective in enhancing students' interest and motivation in learning Economics. This is in agreement with the findings of Ramirez et al. (2024).

As shown in Table 3, the pre-survey results indicate that students demonstrated a moderate level of behavioral engagement in Economics. Students generally agreed that they actively participate in recitations and group activities (WM = 3.13) and enjoy collaborating with their classmates (WM = 3.13). However, they also agreed that they feel shy or hesitant to share their ideas in front of the class (WM = 2.73). This suggests that while students are willing to participate, their confidence in expressing their ideas is still limited. Overall, the findings indicate that students

are somewhat engaged, but their participation is not yet fully active and confident.

Table 3

Pre-Survey Results on Behavioral Engagement

Statement	Weighted Mean	Interpretation
I actively participate in recitations and group activities.	3.13	Agree
I enjoy collaborating with my classmates to complete tasks or solve problems.	3.13	Agree
I feel shy or hesitant to share my ideas in front of the class.	2.73	Agree

Classroom observations during regular instruction support these findings. It was observed that while several students participated in activities, participation was often limited to a few individuals, while others remained passive. Some students appeared hesitant to share their ideas during discussions, indicating a lack of confidence in expressing their thoughts in front of the class.

As to the post-survey results on behavioral engagement, students demonstrated a high level of behavioral engagement after the implementation of KADUYAN. Students strongly agreed that they actively participated and shared their ideas during the game (WM = 3.43) and enjoyed collaborating with their classmates (WM = 3.53). In addition, students strongly agreed that they felt more confident in expressing their ideas because of the game-based setup (WM = 3.43). These findings suggest that the use of KADUYAN created a more interactive and supportive learning environment that encouraged active participation and collaboration among students.

Classroom observations during regular instruction support these findings. It was observed that while several students participated in activities, participation was often limited to a few individuals, while others remained passive. Some students appeared hesitant to share their ideas during discussions, indicating a lack of confidence in expressing their thoughts in front of the class.

A comparison of the pre- and post-survey results reveals a clear and meaningful improvement in students' behavioral engagement. In the pre-survey, students only expressed agreement in terms of participation and collaboration, while also acknowledging their hesitation in sharing ideas. This indicates that although engagement was present, it was not fully developed, particularly in terms of confidence and active involvement. In contrast, the post-survey results

show a shift to strong agreement across all indicators, reflecting a higher level of participation, collaboration, and confidence. The increase in weighted mean scores suggests that students became more actively involved in classroom activities and more comfortable expressing their ideas.

Table 4
Post-Survey Results on Behavioral Engagement

Statement	Weighted Mean	Interpretation
I actively participated and shared my ideas during the game-based activity.	3.43	Strongly Agree
I enjoyed collaborating with my classmates during the game-based activity.	3.53	Strongly Agree
I felt more confident in sharing my ideas because of the game-based activity.	3.43	Strongly Agree

This improvement may be attributed to the game-based nature of KADUYAN, which provided a less formal and more engaging learning environment. The structured activities encouraged teamwork and interaction, allowing students to participate without fear of judgment. As a result, students were able to overcome their hesitation and become more confident contributors in the learning process. These findings indicate that KADUYAN is effective in promoting active and collaborative learning in the classroom.

As shown in Table 5, the pre-survey results indicate that students demonstrated a moderate level of cognitive engagement in Economics. Students agreed that they understand economic concepts using the current teaching methods (WM = 2.98) and can see the connection between Economics and their daily life (WM = 3.15). However, they also agreed that they find it difficult to relate the lessons to their local culture and community (WM = 2.50). This suggests that while students have a basic understanding of the concepts, their ability to fully connect and apply these ideas in a localized context remains limited.

Classroom observations during regular instruction support these findings. It was observed that while students were able to follow the lesson and answer basic questions, some had difficulty explaining concepts in their own words or relating them to real-life and local situations. A number of students relied on memorization rather than deeper understanding, indicating limited

conceptual application.

Table 5

Pre-Survey Results on Cognitive Engagement

Statement	Weighted Mean	Interpretation
I easily understand economic concepts using the current teaching methods.	2.98	Agree
I can see the connection between Economics and my daily life.	3.15	Agree
I find it difficult to relate our lessons to our local culture and community.	2.50	Agree

As shown in Table 6, the post-survey results reveal that students demonstrated a high level of cognitive engagement after the implementation of KADUYAN. Students strongly agreed that the material helped them understand difficult economic concepts more easily (WM = 3.65), see the connection between Economics and Filipino culture (WM = 3.55), and remember the lessons more effectively (WM = 3.58). These findings suggest that KADUYAN improved students' comprehension, relevance, and retention of economic concepts.

Table 6

Post-Survey Results on Cognitive Engagement

Statement	Weighted Mean	Interpretation
KADUYAN helped me understand difficult economic concepts more easily.	3.65	Strongly Agree
I can now see the connection between Economics and our local Filipino culture.	3.55	Strongly Agree
The game-based approach made the lesson more memorable and easier to recall.	3.58	Strongly Agree

Classroom observations during the implementation of KADUYAN further support these

results. Students were observed to better explain concepts using their own words and relate them to familiar and local situations. They were more actively engaged in problem-solving tasks and demonstrated improved understanding during group discussions and game-based activities.

A comparison of the pre- and post-survey results reveals a clear and meaningful improvement in students' cognitive engagement. In the pre-survey, students expressed agreement in terms of understanding economic concepts and relating them to daily life, indicating a basic level of comprehension. However, they also reported difficulty in connecting the lessons to their local culture, suggesting that their understanding was not fully contextualized.

In contrast, the post-survey results show a shift to strong agreement across all indicators, reflecting a higher level of understanding, relevance, and retention. The increase in weighted mean scores indicates that students were able to grasp concepts more easily and connect them to meaningful contexts. The localized and game-based nature of KADUYAN, made abstract economic concepts more concrete and relatable. By integrating cultural context and interactive activities, students were able to better understand and remember the lessons. KADUYAN helps in enhancing students' comprehension and ability to apply economic concepts in real-life situations.

Table 7

Pre-Survey Results on Learning Resources

Statement	Weighted Mean	Interpretation
I learn better when the teacher uses hands-on materials or games.	2.88	Agree
Most of our lessons rely mainly on textbooks and PowerPoint presentations.	2.93	Agree
I am confident that I can achieve high grades in this subject.	2.90	Agree

The pre-survey results indicate that students demonstrated a moderate perception of the learning resources used in Economics. Students generally agreed that they learn better when teachers use hands-on materials or games (WM = 2.88), showing a preference for interactive learning strategies. They also agreed that most lessons rely mainly on textbooks and PowerPoint presentations (WM = 2.93), indicating the dominance of traditional teaching methods in the classroom. In terms of self-confidence, students agreed that they can achieve high grades in the subject (WM = 2.90). This suggests that while students are fairly confident and open to learning,

the current teaching approaches may not fully maximize their engagement. Overall, the findings highlight the need for more interactive and innovative strategies to enhance students' learning experience in Economics.

Classroom observations during regular instruction support these findings. It was observed that lessons were mostly delivered using textbooks and PowerPoint presentations, with limited use of interactive or hands-on materials. While students were able to follow the lesson, some showed passive behavior, indicating that the available learning resources may not fully support active engagement.

Table 8

Post-Survey Results on Learning Resources

Statement	Weighted Mean	Interpretation
I prefer using localized materials (like KADUYAN) over traditional textbooks.	3.55	Strongly Agree
I feel that I learned more effectively through this indigenous approach.	3.48	Strongly Agree
I would like more Economics topics to be taught using the KADUYAN approach.	3.63	Strongly Agree

As shown in Table 8, the post-survey results indicate that students demonstrated a highly positive overall learning experience after the implementation of KADUYAN. Students strongly agreed that they prefer localized materials over traditional textbooks (WM = 3.55), learned more effectively through the approach (WM = 3.48), and want more Economics topics taught using KADUYAN (WM = 3.63). These findings suggest that KADUYAN created a more engaging and effective learning environment.

The implementation of KADUYAN significantly enhanced Grade 9 student engagement in Economics across all affective, behavioral, and cognitive domains. Pre-survey data showed that while students initially preferred hands-on activities, their actual classroom experiences were largely confined to passive, conventional methods like textbooks and PowerPoint presentations. Classroom observations and post-survey results confirmed a profound shift after the intervention; the localized, bamboo-based game material drove active participation, heightened motivation, and generated a strong collective preference for continued interactive learning over traditional instruction.

In conclusion, conventional, lecture-heavy methods restrict learners to passive reception, despite students possessing a natural, pre-existing preference for active learning. Integrating localized, indigenous materials like bamboo makes abstract economic concepts culturally relevant, meaningful, and easier for students to retain. In alignment with Piaget's and Vygotsky's learning theories, the game-based structure of *KADUYAN* successfully bridges the gap between individual cognition and social collaboration through active peer interaction.

It is recommended that Grade 9 *Araling Panlipunan* teachers should systematically integrate *KADUYAN* and similar hands-on interventions into their regular Economics syllabi rather than relying on one-way lectures. Also, school administrators should provide targeted professional development training to help educators source, design, and validate localized learning tools from indigenous local materials. To expand the topic, future researchers should test the scalability of the *KADUYAN* framework across other grade levels and social studies disciplines to evaluate its broader long-term impacts on academic achievement.

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