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ENHANCING GRADE 2 MATH COUNTING SKILLS USING C.O.U.N.T.: CREATING OUTSTANDING UNDERSTANDING WITH NUMBERS THROUGH FLASHCARDS AND POPSICLE STICKS

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ABSTRACT

One of the challenges elementary learners face is developing strong counting skills. This quantitative-descriptive study aimed to determine the improvement of the learners' counting skills upon the implementation of Project C.O.U.N.T., an intervention using flashcards and manipulating objects to enhance the counting skills of Grade 2 learners. The study utilized researcher-designed pre-test and post-test questionnaires, administered to 30 Grade 2 learners from Clementa F. Royo Elementary School during the 2024-2025 academic year. A researcher-designed pre-test and post-test were used to measure students' counting proficiency before and after the intervention. Pre-test results indicated that the students' counting skills were below expectations in counting. However, the post-test scores demonstrated significant improvement, with the students' scores increasing showing that the Project C.O.U.N.T intervention significantly enhanced the students' counting skills. A paired sample t-test revealed a statistically significant difference between pre-test and post-test scores, $t\ (29) = 17.016$, $p < .001$, indicating a substantial gain in counting skills. The results were statistically significant, supporting the conclusion that Project C.O.U.N.T. intervention proved to be an effective strategy for fostering significant gains in counting ability, number concept understanding, and problem-solving accuracy, all of which contribute to the broader goal of mathematical proficiency. The findings suggest that integrating such intervention into elementary education could lead to long-term improvements in students' foundational math skills.

KEYWORDS: *Quantitative-descriptive, Counting Skills, Grade-2 learners, Math Activities, Philippines*

INTRODUCTION

Early counting is a vital math skill that helps children understand numbers, quantity, and problem-solving (Carbonell-Jornet et al., 2022). However, many young learners struggle with one-to-one correspondence, number sequencing, and number sense, which can affect future math success (Nguyen et al., 2020; Friso-van den Bos et al., 2021). Without early support, these gaps may persist.

Globally, children face challenges in counting. In Jamaica, limited interactive learning affects counting development (Nakawa & Furuta, 2024). In the U.S., students with math difficulties rely on inefficient strategies (Kim et al., 2022). South African learners showed low performance in early numeracy, affecting arithmetic and problem-solving (Aunio et al., 2021).

In the Philippines, studies reveal similar issues. Abian (2023) found poor number sense in Puerto Princesa. Munda et al. (2024) reported weak basic skills in Cabuyao City. Abiog (2024) noted counting struggles in Batangas. In Davao del Norte, Grade 2 pupils at Clementa F. Royo Elementary School

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faced difficulties in number recognition and counting sequences due to limited interventions.

To address this, Project C.O.U.N.T. will use flashcards and object manipulation to help Grade 2 learners improve their counting skills through pre- and post-assessment. Supporting studies highlight effective methods like drills (Nabila & Mustaqim, 2023), mental math (Duppins, 2023), and community-based strategies (Causing et al., 2024). While game-based learning has been explored (Biona et al., 2024), this study focuses on strengthening early numeracy.

OBJECTIVES

This study's primary purpose was to determine the level of counting skills before and after the implementation of C.O.U.N.T. of the Day and its impact on grade 2 learners. Specifically, this study sought to answer the following questions:

1. What is the level of grade 2 learners' counting skills before the C.O.U.N.T. of the Day intervention?
2. What is the level of grade 2 learners' counting skills after the C.O.U.N.T. of the Day intervention?
3. Is there a significant difference in counting skills before and after the intervention using the C.O.U.N.T. of the Day intervention?
4. What insights can be drawn from the implementation of the C.O.U.N.T. of the Day intervention regarding its effectiveness in enhancing students' counting skills?

METHODOLOGY

This study used a quantitative-descriptive research design, assessing one group of Grade 2 learners before and after the C.O.U.N.T. of the Day intervention. Pretest and posttest comparisons were used to measure the impact of the intervention, which involved flashcards and popsicle sticks to improve counting skills and student engagement. This design helps evaluate changes in learning outcomes over time. The method aligns with action research, which supports ongoing teacher reflection and professional development (Clark et al., 2020).

SAMPLING DESIGN

The respondents of this study were Grade 2 learners from Clementa F. Royo Elementary School who were identified as having difficulty in counting. Thirty students were purposively selected as participants based on their pre-test scores. These 7-8-year-old students were chosen for C.O.U.N.T. of the Day, an intervention designed to address their specific needs in counting and number sense.

STATISTICAL TOOL

To analyze the intervention's impact, basic descriptive and inferential statistics were applied. The mean measured average performance before and after the program, while the standard deviation showed how consistent the scores were. Cohen's d quantified the practical effect size by comparing pre- and post-test means. A paired t-test ideal for related samples (Gleichmann, 2020) tested whether the change in scores was statistically significant, confirming that the improvement was unlikely due to chance.

RESULTS AND DISCUSSION

Research Question No.1: What is the level of grade 2 learners' counting skills before the C.O.U.N.T. of the Day intervention?

Table 2. ***Mean Average of the Score in Pre-test***

Pre-Test Score	*Frequency*	*Percentage*
6	1	4.0%
7	1	4.0%
8	5	20.0%
9	4	16.0%
10	5	20.0%
11	3	12.0%
12	2	8.0%
13	2	8.0%
16	1	4.0%
Total	**30**	**100%**
Overall		9.23%
Mean Percentage Score		46.17%
Standard Deviation		11.12
Description		Low

Before the intervention, the Grade 2 learners had a very low pretest score of 9.23 (Table 2), indicating weak counting skills and minimal early math exposure. This supports Bonifacci et al. (2018), who noted that children with limited numeracy experience often struggle academically. Mutaf-Yıldız et al. (2020) also found that early learners face ongoing difficulties in counting due to insufficient practice. Aunio et al. (2020) emphasized that early numeracy is a strong predictor of later success, particularly for children from under-resourced backgrounds. Likewise, Purpura, Schmitt, and Gonzalez (2021) stressed that integrated and structured instruction benefits students with limited math exposure, reinforcing the need for targeted interventions.

Research Question No.2: What is the level of grade 2 learners' counting skills after the C.O.U.N.T. of the Day intervention?

Table 3. ***Mean Average of the Score in Post-test***

Post-Test Score	*Frequency*	*Percentage*
13	1	3.33%
14	1	3.33%
15	3	10.00%
16	5	16.67%
17	6	20.00%
18	9	30.00%
19	5	16.67%
Total	**30**	**100%**
Overall		17.03%
Mean Percentage Score		85.17%
Standard Deviation		7.82
Description		High

The post-test mean score of 17.03 (SD = 7.82) shows a marked improvement from the pre-test, demonstrating the effectiveness of the Project C.O.U.N.T. intervention in enhancing Grade 2 students' counting skills. Learners showed better understanding of number concepts, improved accuracy, and applied strategies

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in solving problems, reflecting deeper numeracy readiness. These findings align with Zhou et al. (2020), who emphasized that early math instruction boosts number sense and confidence. Similarly, Bonifacci et al. (2020) and Purpura, Schmitt, and Gonzalez (2021) found that targeted counting instruction improves achievement and school readiness. Caviola et al. (2022) also supported that structured numeracy programs lead to clear gains in early math skills.

Research Question No.3: What is the difference in counting skills before and after the intervention using the C.O.U.N.T of the Day intervention?

Table 4. ***Significant Difference Between the Pre-Test and Post-Test Scores***

Type of Test	*N*	*df*	*Mean*	*Mean difference*	*SE difference*	*SD*	*t-value*	*P-value*	*Cohen's d*	*Decision α=0.05*
Pre-Test	30	29.0	46.17	39	0.46	11.12	17.016	<.001	3.107	Significant
Post-Test	30		85.17			7.82				

Thirty Grade 2 learners participated in pre- and post-tests surrounding the C.O.U.N.T. intervention. The average pre-test score was 46.17 ± 11.12, rising significantly to 85.17 ± 7.82 post-intervention, indicating improved performance and reduced score variation. A paired-samples t-test, $t(29) = 17.016$, $p < .001$, confirmed a statistically significant improvement, while Cohen's $d = 3.107$ reflected an extremely large effect size. These results affirm the intervention's strong effectiveness in enhancing counting skills. This aligns with Charitaki et al. (2021), who emphasized the benefits of structured numeracy programs, Sarnecka and Lee (2022), who supported small-group counting instruction, and Torbeyns et al. (2021), who found number-line activities significantly improve arithmetic fluency.

Research Question No.4: What are the insights of the students about the C.O.U.N.T. as an intervention in enhancing their counting skills?

Table 5. ***Themes and Supporting Statements on the insights of the students about C.O.U.N.T. as an intervention in enhancing their counting skills.***

Emerging Themes	*Supporting Statements*
Improving Counting Skills	"I became better ma'am, especially during recess, my teacher assigns me to count the food and snacks." (IDI-02) "I better understood how to count through the use of your popsicle sticks ma'am and I no longer get confused or mix up numbers." (IDI-05)
Increasing Motivation and Confidence in Counting	"Ma'am, ever since you taught us how to count, I enjoy counting more." (IDI-01) "I feel happy when I get the skip counting right ma'am, and I now like joining on counting because I am jo longer afraid." (IDI-06)
Applying Counting Skills in Everyday Life	"When I am at home ma'am, and my mama asks me to get 20 plate and 20 spoon, I know how many there are in total." (IDI-04) "When I have nothing to do, I still practice skip counting ma'am, and when my mom sends me to buy something, I am no longer afraid because I already know how to count the change." (IDI-07)
Overcoming Difficulties in Counting	"Skip counting is much easier for me now ma'am, just like in the math lesson, I no longer struggle with addition because I have become better at counting." (IDI-06) "Before ma'am I really had a difficulty in counting large numbers but now I truly know how because you and ma'am Jeanne taught us using Popsicle sticks and flashcards." (IDI-07)
Incorporating Interactive Learning Strategies	"It is nice ma'am if there are more games because we enjoy that ma'am." (IDI-04) "It is nice ma'am when there are group activities because we enjoy that." (IDI-06)

Improving Counting Skills. This supports Vendecacion et al. (2025), who found that using arithmetic techniques with manipulatives enhances numeracy, especially in basic operations. Similarly, Verbruggen et al. (2021) highlighted the benefit of combining manipulatives with technology to improve counting mastery. Sani et al. (2023) also confirmed that manipulatives positively impact math performance.

Increasing Motivation and Confidence in Counting. Rahayu et al. (2024) showed that real-world tasks and feedback improve

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motivation. Bowie and Graven (2024) demonstrated the effectiveness of math games in building number sense, and Lange et al. (2020) found that family-involved math games promote engagement and counting motivation.

Applying Counting Skills in Everyday Life. Kesicioğlu (2021) noted that learners begin to use counting to solve real-life problems. Celemin (2023) emphasized the value of authentic tasks in numeracy development, while Tallud and Caballes (2023) found that drills and real objects support practical counting application.

Overcoming Difficulties in Counting. Akther et al. (2025) revealed that hands-on and virtual manipulatives, along with feedback and modeling, improved counting. Aunio et al. (2021) found that South African learners at risk for math difficulties benefited from structured activities. Noh et al. (2024) affirmed that play-based, active learning helps address counting struggles.

Incorporating Interactive Learning Strategies. Vapumarican (2025) found small group games promote number sense through social learning. Olmo-Munoz et al. (2023) showed gamification enhances student engagement. Lagmay et al. (2024) confirmed that game-based learning boosts math achievement.

CONCLUSIONS

This study assessed the effectiveness of the C.O.U.N.T of the Day intervention in enhancing the counting skills of Grade 2 students. The structured, hands-on approach led to a significant improvement in performance, with mean scores increasing from 46.17% to 85.17%. A paired t-test confirmed the statistical significance of this gain. Observations showed that students improved in skip counting, handling larger numbers, and applying counting concepts confidently. Engaging activities like Stick by Stick, Count and Match, and Bingo Plus and Minus using flashcards and popsicle sticks boosted participation and understanding. The intervention produced five key outcomes: enhanced skills, motivation, real-life application, overcoming difficulties, and effective use of interactive strategies. Future research is encouraged to evaluate its long-term effectiveness and broader application.

RECOMMENDATIONS

The study emphasized the importance of improving students' counting skills through targeted numeracy interventions. The significant gains observed support integrating structured programs into the early math curriculum to enhance counting proficiency. For effective implementation, sessions should occur regularly ideally daily or three to five times a week and should include both direct instruction and problem-solving games to promote active learning. Teachers play a crucial role by offering personalized guidance and feedback. Incorporating technology-based tools like educational apps and interactive games can further engage students and provide flexible, extended learning opportunities. Overall, the success of the intervention highlights the value of a structured, interactive, and tech-supported approach in developing foundational math skills and promoting long-term numeracy growth.

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