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Using Concrete-Pictorial-Abstract (CPA) Approach to Enhance Grade 1 Pupils' Focus and Learning Retention in Mathematics

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Abstract- ***This study aimed to determine the effectiveness of the Concrete–Pictorial–Abstract (CPA) Approach in strengthening Grade 1 pupils' focus and learning retention in Mathematics at a selected elementary school in Ozamiz City during the school year 2025–2026. A classroom-based action research design using a single-group pretest–posttest approach was employed. The respondents consisted of thirty-eight (38) Grade 1 pupils selected through purposive sampling. Data were collected using a researcher-made Mathematics Achievement Test to measure pupils' performance and a researcher-designed Observation Checklist to assess pupils' focus and learning retention before and after the implementation of the CPA approach. The research instruments were validated by education experts and pilot tested with a selected group of participants to establish their validity and reliability. Data were analyzed using mean, standard deviation, and paired t-test through Jamovi. Findings revealed that pupils' mathematics performance improved from fairly satisfactory before the implementation to outstanding after the intervention. Similarly, pupils' learning retention increased from very low before implementation to very high after the CPA approach was applied. Statistical analysis further showed a very highly significant difference in both pupils' mathematics performance and learning retention before and after the implementation of the CPA approach. The study concluded that the CPA approach is an effective instructional strategy in improving Grade 1 pupils' mathematics performance, focus, and learning retention.***

Keywords: mathematics education, concrete-pictorial-abstract approach, learning retention, focus, grade 1 pupils, mathematics performance

I. INTRODUCTION

Context and Rationale

Recent trends in mathematics education highlight the growing shift toward instructional approaches that build conceptual understanding through structured learning progressions. One of the most widely adopted and researched approaches internationally is the Concrete–Pictorial–Abstract (CPA) model, which has shown increasing global relevance in improving mathematical learning outcomes. Systematic reviews indicate that CPA is consistently effective in enhancing students' mathematical achievement, attitudes, reasoning, and engagement across different grade levels and learning contexts (Lutfi & Dasari, 2024). Research further shows that CPA benefits both typical learners and those with learning difficulties, demonstrating its versatility and adaptability in diverse classrooms (Amril & Juandi, 2020).

Despite these promising findings, research also reveals implementation challenges. Teachers report difficulties in using CPA due to time constraints, large class sizes, and limited learning materials (Yullia & Putri, 2021). Furthermore, while many studies focus on upper elementary levels, particularly Grades 3–6, there is a noticeable lack of research applying CPA in early primary grades, especially Grade 1, where foundational concepts are introduced (Hongthong, 2024). Importantly, few studies examine CPA's impact on young learners' focus and learning retention, critical areas for Grade 1 pupils who often struggle to sustain Attention and consolidate mathematical concepts effectively.

This study focuses on using the Concrete–Pictorial–Abstract (CPA) approach to help Grade 1 pupils stay focused and remember mathematical concepts more effectively. By moving from hands-on activities to visual models and finally to symbols, pupils can follow the lesson more clearly and stay engaged

throughout the learning process. Studies show that CPA strengthens understanding, supports engagement with learning tasks, and helps learners retain mathematical ideas more effectively (Lokkathat et al., 2025). Research also notes that CPA keeps young learners attentive by providing concrete and pictorial support before moving to abstract symbols (Mas'udah & Utaminingsih, 2024).

There appears to be a population gap in the prior research. There is a lack of studies that focus on the use of Exit Pass as a formative assessment strategy to improve focus and learning retention among Grade 1 pupils, particularly in mathematics. Most existing research has been conducted among older learners, leaving little understanding of how younger pupils respond to this strategy. It is important to fill this gap since early learners have different learning behaviors and attention spans compared to older students (Miles, 2017).

The study aims to strengthen Grade 1 pupils' focus and learning retention in mathematics by examining improvements in Attention, recall, and problem-solving skills (Putri et al., 2020). By integrating CPA in the classroom, the study seeks to provide teachers with practical strategies that enhance Participation, comprehension, and confidence. The findings are expected to show that structured use of CPA can improve focus and retention of mathematical concepts (Mas'udah & Utaminingsih, 2024) and promote active, meaningful learning experiences for young learners (Iyamuremye & Burns, 2025).

Strategy

CPA (Concrete–Pictorial–Abstract) is an effective teaching strategy that helps young learners understand mathematical concepts by moving from hands-on experiences to visual representations and, finally, to abstract symbols (Putri et al., 2020). This approach allows pupils to grasp concepts more concretely, strengthen reasoning skills, and retain knowledge longer, making it suitable for improving focus and learning retention in early primary grades (Mas'udah & Utaminingsih, 2024).

By engaging pupils with concrete manipulatives such as counters, blocks, or coins, teachers provide tangible experiences that make abstract ideas easier to understand. The pictorial stage then bridges understanding by encouraging learners to represent their thinking through drawings, diagrams, or visual models (Iyamuremye & Burns, 2025). Finally, the abstract stage introduces symbols and numbers to solve problems independently, allowing learners to connect prior experiences to new mathematical concepts (Sello et al., 2024).

For instance, Hongthong's 2024) study in Thailand reported that the CPA approach produced a statistically significant improvement in students' number sense, indicating that learners taught through CPA performed better than those who received conventional instruction.

Implementing CPA in Grade 1 can be done through a series of structured steps. First, teachers identify the key learning goal for each lesson, ensuring that the concept is clear and developmentally appropriate for young learners (Africa et al., 2020). Next, they select suitable manipulatives, such as counters, blocks, or coins, to provide hands-on experiences that concretely illustrate the concept. Following this, teachers prepare simple visual prompts or guided exercises that gradually transition pupils from concrete activities to pictorial representations, and finally to abstract symbols and problem-solving tasks (Junior et al., 2025).

During each stage, teachers carefully monitor learners' engagement and understanding, offering support or corrective feedback as needed to ensure that pupils fully grasp the concept. Regular application of CPA encourages students to stay focused by actively participating in each step and reflecting on their learning, which reinforces retention by linking concrete experiences to conceptual understanding. To sustain effectiveness, teachers should integrate CPA activities into daily lessons, review pupils' work consistently, and adjust instruction according to observed difficulties (Putri et al., 2020). When implemented systematically, CPA becomes a meaningful strategy that strengthens mathematical skills while cultivating Attention, confidence, and long-term learning in Grade 1 pupils (Mas'udah & Utaminingsih, 2024).

Statement of the Problem

This study aims to determine the effectiveness of the Concrete–Pictorial–Abstract (CPA) approach in strengthening Grade 1 pupils' focus and learning retention in mathematics at a selected school in Ozamiz City during the school year 2025–2026. Specifically, it seeks to answer the following questions:

1. What is the performance of Grade 1 pupils in mathematics before the implementation of the CPA approach?
2. What is the performance of Grade 1 pupils in mathematics after the implementation of the CPA approach?
3. What is the level of learning retention of Grade 1 pupils in mathematics before the implementation of the CPA approach?
4. What is the level of learning retention of Grade 1 pupils in mathematics after the implementation of the CPA approach?
5. Is there a significant difference in the pupils' performance before and after the implementation of the CPA approach?
6. Is there a significant difference in the pupils' learning retention before and after the implementation of the CPA approach?

Null Hypotheses

H01: There is no significant difference in the level of focus of Grade 1 pupils in mathematics before and after the implementation of the Concrete Pictorial Abstract (CPA) approach.

H02: There is no significant difference in the level of learning retention of Grade 1 pupils in mathematics before and after the implementation of the Concrete Pictorial Abstract (CPA) approach.

II. RESEARCH METHODOLOGY

Research Design

This study employed a classroom-based action research approach using a single pretest-posttest design. A pretest–posttest design evaluates a strategy by measuring pupils' skills before and after its implementation (Amalia et al., 2024). The design is deemed appropriate in this study as it will allow researchers to assess how structured lessons that progress from concrete manipulatives to pictorial representations and finally to abstract symbols affect pupils' Attention, engagement, comprehension, and retention of key mathematical concepts (Rodriguez et al., 2024).

Research Setting

This study was conducted in one of the elementary schools in Ozamiz City, Misamis Occidental, Philippines. The school offers complete elementary education, including Grade 1. The research will focus on Grade 1 pupils enrolled in the mathematics subject, which introduces foundational numeracy skills such as addition, subtraction, and simple problem-solving.

A single section of Grade 1 pupils was selected as respondents for this study. This group is ideal for examining the effects of the Concrete–Pictorial–Abstract (CPA) approach, as these learners are developing foundational mathematical skills and are beginning to practice focus, engagement, and retention. By implementing CPA-based lessons that progress from concrete manipulatives to pictorial representations and finally to abstract symbols, the study aims to determine how this structured approach influences pupils' Attention, understanding, and retention of key mathematical concepts.

Respondents of the Study

This study includes thirty-eight (38) Grade 1 pupils enrolled in one of the public elementary schools in Ozamiz City, Misamis Occidental, Philippines, for the S.Y. 2025–2026. Purposive sampling was employed to ensure that the selected respondents actively participate in mathematics and are directly engaged in learning foundational numeracy skills. Only pupils whose parents or guardians consented to their Participation were included, ensuring adherence to ethical research standards. This selection aims to address the gap in research on the effectiveness of the Concrete–Pictorial–Abstract (CPA) approach in improving young learners' focus, understanding, and retention of mathematical concepts. By focusing on this group, the study provides insights into how CPA-

based lessons can enhance meaningful learning in Grade 1 mathematics.

Research Instrument

The study used the following questionnaires as data-gathering instruments:

A. Performance of Grade 1 pupils in mathematics (Appendix A). This researcher-designed Mathematics Achievement Test, consisting of 25 items, measured Grade 1 pupils' learning retention in Mathematics before and after the implementation of the CPA approach. The test includes short, age-appropriate items that progress from concrete manipulatives to pictorial representations and, finally, to abstract numerical comparisons, allowing pupils to demonstrate understanding at each stage. To ensure validity, education experts reviewed the test items for clarity, relevance, and accuracy, and a pilot test was conducted to evaluate their appropriateness for Grade 1 learners. Reliability was assessed using Cronbach's alpha, with values above 0.70 indicating consistency and suitability for measuring pupils' retention of foundational numeracy skills.

This scale was used to determine test performance.

Scores	Remarks
22–25	Outstanding
20–21	Very Satisfactory
18–19	Satisfactory
15–17	Fairly Satisfactory
1–14	Did Not Meet Expectations

B. Learning Retention of Grade 1 pupils in mathematics (Appendix B). This researcher-designed checklist, consisting of 25 items, evaluates Grade 1 pupils' focus and engagement in Mathematics before and after the implementation of the CPA approach. Based on previous studies highlighting CPA's effectiveness in enhancing focus (Rodriguez et al., 2024), the checklist contains short, age-appropriate indicators rated by the teacher during each 40-minute lesson, which progress from concrete manipulatives to pictorial representations and finally to abstract symbols. To ensure validity, education experts reviewed the tool for clarity and relevance, and a pilot test confirmed its appropriateness. Reliability was tested using Cronbach's alpha, with values above 0.70, indicating consistency.

Pupils' performance in focus, Participation, and application of mathematical concepts will be measured using a 5-point Likert scale, with 5 representing excellent performance and full engagement and 1 representing poor performance and minimal engagement.

Responses	Continuum	Interpretation
5	4.20-5.0	Very High
4	3.40 -4.19	High
3	2.60-3.39	Moderate
2	1.80-2.59	Low
1	1.0-1.79	Very Low

C. Lesson Plan (Appendix C). In this study, the CPA approach was integrated into the Grade 1 Mathematics Lesson Plan, covering foundational numeracy skills. Each 40-minute session begins with a short review, followed by teacher-led instruction using concrete manipulatives, pictorial representations, and guided practice. To ensure validity, education experts reviewed the plan for clarity, relevance, and alignment with Grade 1 competencies.

Data Collection

Prior to data collection, the researcher secured formal approval to conduct the study by submitting request letters to the appropriate authorities, including the Dean of the College, the Schools Division Superintendent, and the School Principal of the selected elementary school in Ozamiz City. Upon approval from the Superintendent and the Principal, subsequent letters were addressed to the ELC Coordinator and the Cooperating Teacher, and their consent was obtained before implementing any data collection procedures. Each letter clearly outlined the objectives, methodology, and scope of the study to ensure transparency and adherence to institutional and ethical guidelines. Following the approval

process, informed consent forms were distributed to the parents or guardians of the Grade 1 pupils, together with assent forms for the pupils, to ensure voluntary and ethical Participation.

The study focused on improving focus and learning retention in Mathematics through the Concrete–Pictorial–Abstract (CPA) approach. Data collection was conducted over several lessons, each lasting 40 minutes. Each session began with a brief review of previous lessons, followed by teacher-led instruction on the day's topic. Pupils engaged in hands-on activities using concrete manipulatives, represented their understanding through pictorial models, and finally solved problems using abstract symbols and numbers.

To assess pupils' progress, a pre-assessment was administered before the first CPA lesson to determine baseline levels of focus and learning retention. After the final lesson, a post-assessment was conducted to measure improvement. Pupils' focus, engagement, and retention will be rated using the Observation Checklist (Instrument A), with scores analyzed to determine changes in performance. Standardized scoring criteria on the 5-point Likert scale ensured reliable and objective measurement of pupils' growth throughout the study.

Ethical Consideration

Before conducting the study, ethical considerations were carefully established to prioritize the well-being, rights, and privacy of all participants. Approval was sought from the Misamis University Research Ethics Committee (MUREC) to ensure compliance with institutional and ethical research standards. Additionally, the researcher ensured that all ethical standards were followed to protect the well-being of the respondents. Approval to conduct the study was sought from the School Principal, the Grade Level Head, and the class Adviser, with each authority's consent obtained before any data collection. These approvals confirmed that the study complies with institutional and research guidelines. Informed consent procedures were implemented for all participants. Parents or guardians of the selected Grade 1 pupils provided formal consent, and the pupils themselves were given assent, indicating their voluntary Participation. Participants were fully informed of the study's objectives, procedures, potential benefits, and possible risks, and they will have the option to withdraw at any time without negative consequences.

Confidentiality and anonymity were strictly maintained. All collected data will be anonymized; personally identifiable information will be excluded, and participants will be assigned coded identifiers. Both digital and physical data will be securely stored, with digital files encrypted and physical copies kept in a locked cabinet accessible only to the researcher. These measures complied with Republic Act No. 10173 (Data Privacy Act of 2012), ensuring participants' privacy, dignity, and security. By adhering to these ethical considerations, the researcher safeguards participant welfare while maintaining the integrity and credibility of the study.

Data Analysis

This study utilized the following statistical methods for data analysis using JAMOVI software:

Frequency and percentage were used to determine the performance of the pupils before and after the implementation of the CPA approach.

Mean and standard deviation were used to measure the pupils' total scores on the Observation Checklist as an indicator of focus and learning retention.

A paired t-test was conducted to determine significant differences in pupils' focus and learning retention before and after the implementation of the CPA approach.

Dissemination Plan

The findings of this study were shared with school administrators, teachers, Grade 1 pupils, and parents through reports, discussions, and simple summaries, highlighting the benefits of the Concrete–Pictorial–Abstract (CPA) approach in improving focus and learning retention in mathematics. Ethical considerations, including consent and assent, were observed when presenting results to pupils and parents. The results were disseminated to the university community and other educators through seminars, presentations, and publications to provide practical insights and recommendations for

implementing CPA-based teaching strategies in early mathematics classrooms.

Utilization Plan

The results of the study were disseminated through a poster presentation and Publication. A poster summarizing the key findings, conclusions, and recommendations was prepared and displayed during academic or research dissemination events, allowing educators, school stakeholders, and other researchers to understand the study's outcomes and apply its insights easily. Additionally, the study was prepared for Publication in an academic journal or institutional research repository, ensuring that its contributions reach a wider audience and support further research on strengthening pupil focus, learning retention, and the effective use of the Concrete–Pictorial–Abstract (CPA) approach in mathematics instruction.

COST ESTIMATES

(Grade 1)

The estimated budget for the conduct of this study is broken down below from the personal money of the proponent. The proponent has a personal laptop and printer.

Materials	Amount
1 ream A4 US bond paper	Php 180.00
1 set 664 ink	Php 1,179.00
2 sliding folders	Php 15.00 x 2 (Php 30.00)
Tokens (Pencil & Paper)	Php 1, 000.00
Snacks	Php 1, 500.00
Total	Php 3, 889.00

III. RESULTS AND DISCUSSIONS

Performance of Grade 1 Pupils in Mathematics Before the Implementation of the Concrete-Pictorial-Abstract (CPA) Approach

Table 1 presents the performance of Grade 1 pupils in Mathematics before the implementation of the Concrete-Pictorial-Abstract (CPA) approach. Overall, the pupils' performance was at a fairly satisfactory level (M = 17.67, SD = 0.96). This finding suggests that the pupils had a basic understanding of mathematical concepts but still experienced difficulties in mastering some skills in Mathematics. The result indicates the need for more engaging and appropriate learning strategies, such as the CPA approach, to improve pupils' understanding and performance.

The findings indicate that most Grade 1 pupils demonstrated limited mastery of mathematical concepts prior to the use of the CPA approach. The large proportion of pupils in the lower performance levels suggests that many pupils may have struggled with abstract mathematical ideas when taught using traditional methods. Only a small number reached higher performance levels, implying that existing instructional strategies may not have sufficiently supported diverse learning needs. This pattern highlights a gap in conceptual understanding, particularly for young learners who typically benefit from hands-on and visual learning experiences.

This finding suggests that pupils need engaging and appropriate learning strategies to strengthen their understanding and performance in Mathematics. The Concrete-Pictorial-Abstract (CPA) approach has been found effective in improving pupils' mathematical learning outcomes and conceptual understanding (Lutfi & Dasari, 2024). Pupils who learned through the CPA approach also demonstrated better mathematical reasoning abilities compared to those who received conventional instruction (Putri et al., 2020). Moreover, the CPA approach significantly improved pupils' numeracy skills by helping them understand concepts through concrete objects, pictures, and symbols (Suryaningsih et al., 2025). Similarly, the CPA approach enhanced pupils' academic achievement, problem-solving, and reasoning skills in Mathematics (Isa & Qudus, 2024). These studies support the present finding that the CPA approach is an effective strategy in improving pupils' mathematical understanding and performance. These results suggest the need for instructional improvement among teachers and school administrators. Teachers may adopt the CPA approach more consistently by integrating concrete materials (e.g., counters, blocks), pictorial representations (e.g., drawings, diagrams), and abstract symbols in their lessons. School heads may

also provide training and instructional support focused on CPA-based strategies. Additionally, activities such as guided manipulative exercises, visual problem-solving tasks, and step-by-step progression from concrete to abstract representations can be implemented to help pupils better understand mathematical concepts and improve their performance.

Table 1 Performance of Grade 1 Pupils in Mathematics Before the Implementation of the Concrete-Pictorial-Abstract (CPA) Approach

Performance	Frequency	Percentage	M	SD
Outstanding	1	2.6	22.00	_
Very Satisfactory	2	5.3	20.5	0.7
Satisfactory	5	13.1	18.4	0.55
Fairly Satisfactory	15	39.5	15.87	0.83
Did Not Meet Expectations	15	39.5	11.6	0.83
Overall Performance	38	100.00	17.67	0.96

Note: 22-25 (Outstanding); 20–21 Very Satisfactory); 18-19 (Satisfactory); 15-17 (Fairly Satisfactory); 1-14 (Did Not Meet Expectations)

Performance of Grade 1 Pupils in Mathematics After the Implementation of the Concrete-Pictorial-Abstract (CPA) Approach

Table 2 presents the performance of Grade 1 pupils in Mathematics after the implementation of the Concrete-Pictorial-Abstract (CPA) approach. Overall, the pupils' performance was at an Outstanding level (M = 22.35, SD = 0.71). This finding suggests that implementing the CPA approach significantly improved the pupils' understanding and mastery of mathematical concepts and skills. The result indicates that the CPA approach was effective in enhancing pupils' performance in Mathematics. The findings indicate that implementing the CPA approach positively influenced the mathematics performance of Grade 1 pupils. The high overall mean suggests that most pupils were able to understand and apply mathematical concepts effectively after being exposed to concrete materials, pictorial representations, and abstract symbols. The large percentage of pupils who achieved an Outstanding rating further implies that the CPA approach helped improve pupils' comprehension, engagement, and confidence in learning Mathematics. Moreover, the absence of pupils in the lower performance categories may indicate that the CPA approach was effective in addressing pupils' learning difficulties and supporting their mathematical development at an early age. Since Grade 1 pupils learn better through hands-on and visual activities, the CPA approach may have provided meaningful learning experiences that enhanced their academic performance.

The findings revealed that the Concrete-Pictorial-Abstract (CPA) approach was effective in improving pupils' Mathematics performance and understanding of concepts. Pupils taught using the CPA approach demonstrated better mathematical reasoning abilities than those who received conventional instruction (Putri et al., 2020). The CPA approach also significantly enhanced pupils' numeracy skills by helping them understand concepts through concrete objects, visual representations, and abstract symbols (Suryaningsih et al., 2025). Moreover, the CPA approach positively affected pupils' academic achievement, problem-solving, and reasoning skills in Mathematics (Isa & Qudus, 2024). Grade 1 pupils likewise showed significantly higher Mathematics achievement and number sense after the implementation of the CPA approach (Hongthong et al., 2024). These studies support the present findings that the CPA approach is an effective strategy in enhancing pupils' Mathematics performance.

The findings imply that teachers and school administrators may continuously integrate the CPA

approach in Mathematics instruction, particularly in the primary grades, to strengthen pupils' conceptual understanding and performance. Teachers may also develop more interactive and learner-centered activities using manipulatives, pictures, and guided exercises to sustain pupils' interest and Participation in Mathematics lessons. Furthermore, schools may provide instructional materials and conduct training or workshops for teachers on the effective implementation of the CPA approach. Parents may also be encouraged to support pupils' learning at home through simple, concrete, and visual activities that reinforce mathematical concepts learned in school.

Table 2 Performance of Grade 1 Pupils in Mathematics After the Implementation of the Concrete-Pictorial-Abstract (CPA) Approach

Performance	Frequency	Percentage	M	SD
Outstanding	31	81.6	24.00	0.93
Very Satisfactory	7	18.4	20.7	0.49
Overall Performance	38	100.00	22.35	0.71

Note: 22-25 (Outstanding); 20–21 Very Satisfactory); 18-19 (Satisfactory); 15-17 (Fairly Satisfactory); 1-14 (Did Not Meet Expectations)

Learning Retention of Grade 1 Pupils in Mathematics Before the Implementation of the Concrete-Pictorial-Abstract (CPA) Approach

Table 3 presents the level of learning retention of Grade 1 pupils in Mathematics before the implementation of the Concrete-Pictorial-Abstract (CPA) approach. Overall, the pupils' level of learning retention was described as Low (M = 2.29, SD = 0.33). Among the constructs, Attention obtained the highest mean score (M = 2.35, SD = 0.38), followed by Task Engagement (M = 2.33, SD = 0.33), Following Instructions (M = 2.32, SD = 0.35), Participation (M = 2.26, SD = 0.29), and On-Task Behavior (M = 2.21, SD = 0.30). All constructs were interpreted as Low. This overall finding suggests that the pupils had limited ability to maintain focus, engagement, and active Participation during Mathematics lessons before the implementation of the CPA approach. The result may imply that the pupils needed more engaging and interactive learning experiences to strengthen their retention and understanding of mathematical concepts.

The pupils had difficulty sustaining consistent learning retention in Mathematics prior to the implementation of the CPA approach. Although pupils showed some level of Attention and engagement, the low ratings across all constructs suggest that they struggled to maintain focus, participate actively, and remain on-task during learning activities. The lowest mean obtained by On-Task Behavior further implies that pupils experienced challenges in maintaining concentration and completing tasks effectively. Since Grade 1 pupils are still in the early stage of cognitive and behavioral development, traditional teaching methods alone may not have been sufficient to support their learning retention and conceptual understanding in Mathematics.

The findings are supported by several studies that emphasized the importance of the CPA approach in improving pupils' engagement, Participation, and learning retention in Mathematics. The CPA approach was found to enhance pupils' numeracy skills and understanding of mathematical concepts through the use of concrete objects, visual representations, and abstract symbols (Suryaningsih et al., 2025). Pupils exposed to the CPA approach also demonstrated better mathematical reasoning and conceptual understanding than those who received conventional instruction (Putri et al., 2020). Moreover, the CPA approach improved pupils' Participation and engagement in Mathematics lessons by allowing them to actively manipulate materials and visualize concepts during learning activities (Rozata & Theoneste, 2024). Similarly, the CPA approach significantly enhanced Grade 1 pupils' number sense and Mathematics achievement after its implementation (Hongthong et al., 2024). These

studies support the present findings that engaging and learner-centered approaches, such as CPA, are necessary to improve pupils' learning retention and understanding in Mathematics.

Teachers need to utilize more interactive and developmentally appropriate teaching strategies to improve pupils' learning retention in Mathematics. The CPA approach may help address these gaps by providing concrete materials, visual representations, and guided activities that can sustain pupils' Attention, Participation, and engagement. School administrators may also support teachers by providing instructional resources and training related to learner-centered approaches in Mathematics instruction. Furthermore, parents may be encouraged to reinforce classroom learning through simple hands-on and visual activities at home to strengthen pupils' retention and understanding of mathematical concepts.

Table 3 Level of Learning Retention of Grade 1 Pupils in Mathematics Before the Implementation of the Concrete-Pictorial-Abstract (CPA) Approach

Constructs	M	SD	Remarks
Attention	2.35	0.38	Very Low
Participation	2.26	0.29	Very Low
Task Engagement	2.33	0.33	Very Low
Following Instructions	2.32	0.35	Very Low
On-Task Behavior	2.21	0.3	Very Low
Overall Level of Learning Retention	2.29	0.33	Very Low

Note: 4.20-5.0 (Very High); 3.40 -4.19 (High); 2.60-3.39 (Moderate); 1.80-2.59 (Low); 1.0-1.79 (Very Low)

Learning Retention of Grade 1 Pupils in Mathematics After the Implementation of the Concrete-Pictorial-Abstract (CPA) Approach

Table 4 presents the level of learning retention of Grade 1 pupils in Mathematics after the implementation of the Concrete-Pictorial-Abstract (CPA) approach. Overall, the pupils' level of learning retention was described as Very High (M = 4.74, SD = 0.16). Among the constructs, On-Task Behavior obtained the highest mean score (M = 4.78, SD = 0.14), followed by Following Instructions (M = 4.75, SD = 0.15), Task Engagement (M = 4.74, SD = 0.18), Attention (M = 4.73, SD = 0.19), and Participation (M = 4.72, SD = 0.13). All constructs were interpreted as Very High. This overall finding suggests that pupils demonstrated strong Attention, active Participation, and consistent engagement in Mathematics lessons after implementing the CPA approach. It implies that the CPA approach provided meaningful and interactive learning experiences that enhanced pupils' retention and understanding of mathematical concepts.

The findings indicate that the CPA approach positively influenced the learning retention of Grade 1 pupils in Mathematics. The very high ratings across all constructs suggest that pupils became more attentive, participative, and engaged during classroom activities after being exposed to concrete materials, pictorial representations, and abstract concepts. The highest mean obtained by On-Task Behavior implies that pupils were able to stay focused and complete learning tasks effectively. Meanwhile, the high ratings in Following Instructions and Task Engagement indicate that the CPA approach helped pupils better understand classroom activities and participate actively in the learning process. Since young pupils learn more effectively through hands-on and visual experiences, the CPA approach may have enhanced their motivation, concentration, and retention in Mathematics lessons.

The CPA approach significantly improved pupils' numeracy skills and conceptual understanding by allowing them to learn through concrete objects,

pictures, and symbols (Suryaningsih et al., 2025). Pupils exposed to the CPA approach also demonstrated higher mathematical reasoning and better understanding of concepts compared to those who received conventional instruction (Putri et al., 2020). Moreover, the CPA approach enhanced pupils' classroom participation and engagement because learners were actively involved in manipulating materials and visualizing mathematical concepts during instruction (Rozata & Theoneste, 2024). Similarly, Grade 1 pupils showed significantly higher number sense and Mathematics achievement after implementing the CPA approach (Hongthong et al., 2024). These studies support the present findings that the CPA approach is an effective learner-centered strategy in improving pupils' learning retention and performance in Mathematics.

Teachers may continuously integrate the CPA approach in Mathematics instruction to sustain pupils' Attention, Participation, and engagement in learning activities. Teachers may also develop more interactive and hands-on classroom activities using manipulatives, visual aids, and guided practice to strengthen pupils' retention and conceptual understanding further. School administrators may support the implementation of the CPA approach by providing adequate instructional materials and professional development programs for teachers. Furthermore, parents may be encouraged to reinforce learning at home through simple, concrete, and visual activities that can help pupils retain and apply mathematical concepts in daily life.

Table 4 Level of Learning Retention of Grade 1 Pupils in Mathematics After the Implementation of the Concrete-Pictorial-Abstract (CPA) Approach

Constructs	M	SD	Remarks
Attention	4.73	0.19	Very High
Participation	4.72	0.13	Very High
Task Engagement	4.74	0.18	Very High
Following Instructions	4.75	0.15	Very High
On-Task Behavior	4.78	0.14	Very High
Overall Level of Learning Retention	4.74	0.16	Very High

Note: 4.20-5.0 (Very High); 3.40 -4.19 (High); 2.60-3.39 (Moderate); 1.80-2.59 (Low); 1.0-1.79 (Very Low)

Significant Difference in the Pupils' Performance Before and After the Implementation of the CPA Approach

Table 5 presents the significant difference in the pupils' performance before and after the implementation of the Concrete-Pictorial-Abstract (CPA) approach. The results show a very highly significant difference in pupils' performance, as indicated by the computed t-value and p-value ($t = 14.80$, $p < .001$). This led to the rejection of the null hypothesis (H_{01}). The mean score of the pupils increased from before implementation ($M = 14.90$, $SD = 3.32$) to after implementation ($M = 23.40$, $SD = 1.55$), indicating a substantial performance improvement.

The significant result suggests that the CPA approach had a strong positive effect on the pupils' mathematics performance. The large increase in mean scores implies that pupils were better able to understand and apply mathematical concepts when lessons progressed from concrete materials to pictorial representations and then to abstract symbols.

Moreover, the lower standard deviation after the implementation indicates more consistent performance among pupils, suggesting that the approach helped reduce learning gaps. This supports the idea that young pupils benefit from structured, developmentally appropriate instructional strategies that build conceptual understanding step by step.

The findings are supported by several studies which highlight the effectiveness of the Concrete-Pictorial-Abstract (CPA) approach in improving pupils' Mathematics performance. Pupils taught using the CPA approach performed significantly better in mathematical reasoning compared to those exposed to conventional teaching methods (Putri et al., 2020). CPA was also found to significantly improve pupils' numeracy skills by helping them understand mathematical concepts through concrete objects, visual representations, and abstract symbols (Suryaningsih et al., 2025). In addition, the CPA approach significantly enhanced pupils' academic achievement in Mathematics, particularly in problem-solving and reasoning skills (Isa & Qudus, 2024). Grade 1 pupils exposed to CPA instruction likewise showed significantly higher Mathematics achievement and number sense after the intervention (Hongthong et al., 2024). These studies support the present finding that the CPA approach significantly improves pupils' Mathematics performance and learning outcomes.

Teachers and school administrators may consider adopting the CPA approach as a regular instructional strategy in teaching Mathematics, especially in early grade levels. Teachers are encouraged to design lessons that incorporate hands-on activities using manipulatives (e.g., counting objects, blocks), followed by drawing or visual representation tasks, and finally transitioning to abstract problem-solving. School heads may organize training workshops focused on CPA implementation and provide adequate instructional materials. Additionally, regular monitoring and support can ensure that the approach is applied effectively to sustain and further improve pupils' learning outcomes.

Table 5 Significant Difference in the Pupils' Performance Before and After the Implementation of the CPA Approach

Performance	M	SD	T-value	P-value	Decision
Before the Implementation of the Concrete-Pictorial-Abstract (CPA) Approach	14.9	3.32	14.8***	<.001	Reject H_{01}
After the Implementation of the Concrete-Pictorial-Abstract (CPA) Approach	23.4	1.55			

Note: ***p<0.01 (Very Highly Significant); **p<0.01 (Highly Significant); *p<0.05 (Significant)

Significant Difference in the Pupils' Learning Retention Before and After the Implementation of the CPA Approach

Table 6 presents the significant difference in the pupils' learning retention in Mathematics before and after the implementation of the Concrete-Pictorial-Abstract (CPA) approach. The results show that all variables yielded very highly significant differences with p-values less than 0.05, leading to the rejection of the null hypothesis (H_{02}). Specifically, significant improvements were observed in Attention (t = 34.9, p = 0.001), Participation (t = 50.1, p = 0.001), Task Engagement (t = 44.6, p = 0.001), Following Instructions (t = 41.8, p = 0.001), and On-Task Behavior (t = 53.6, p = 0.001). These results indicate that all aspects of learning retention significantly improved after implementing the CPA approach.

The significant increase in Attention (t = 34.9, p = 0.001) suggests that pupils became more focused and responsive during Mathematics lessons after exposure to CPA-based instruction. This implies that the use of concrete materials and visual representations helped sustain pupils' interest and concentration. Similarly, Participation (t = 50.1, p =

0.001) showed a very highly significant improvement, indicating that pupils became more actively involved in classroom activities, likely due to the hands-on nature of CPA learning experiences. Task Engagement (t = 44.6, p = 0.001) also increased significantly, suggesting that pupils were more motivated and willing to complete learning tasks when lessons were presented through concrete, pictorial, and abstract stages. Following Instructions (t = 41.8, p = 0.001) also improved significantly, which may imply that structured CPA lessons helped pupils better understand and follow teacher directions during activities. Lastly, On-Task Behavior (t = 53.6, p = 0.001) obtained the highest t-value, indicating a great improvement in pupils' ability to remain focused and consistently engaged in learning tasks. This suggests that CPA instruction effectively minimized off-task behavior and supported sustained learning engagement.

Pupils who were taught using the CPA approach demonstrated significantly higher levels of Attention, Participation, and task engagement compared to those exposed to traditional teaching methods (Putri et al., 2020). The CPA approach also significantly improved pupils' on-task behavior and classroom participation by allowing learners to actively manipulate concrete materials and visualize mathematical concepts (Rozata & Theoneste, 2024). In addition, CPA-based instruction was found to enhance pupils' ability to follow instructions and sustain engagement during Mathematics lessons, leading to better learning outcomes (Suryaningsih et al., 2025). Similarly, Grade 1 pupils exposed to CPA instruction showed significantly improved Mathematics achievement and behavioral engagement after intervention (Hongthong et al., 2024). These studies support the present findings that the CPA approach significantly enhances pupils' learning retention across all behavioral and cognitive domains.

CPA approach is an effective instructional strategy in improving Grade 1 pupils' learning retention in Mathematics. Teachers are encouraged to integrate CPA-based activities such as manipulatives, visual representations, and guided symbolic exercises consistently to maintain pupils' Attention and engagement. School administrators may provide training programs and instructional materials to support the effective implementation of CPA in early grade classrooms. Additionally, curriculum planners may consider strengthening CPA integration in Mathematics lessons to enhance pupils' active Participation, task engagement, and overall learning behavior.

Table 6 Significant Difference in the Pupils' Learning Retention Before and After the Implementation of the CPA Approach

Variables	T-value	P-value	Decision
Pre-Attention Post-Attention	34.9***	0.001	Reject H_{o2}
Pre-Participation Post-Participation	50.1***	0.001	Reject H_{o2}
Pre-Task Engagement Post-Task Engagement	44.6***	0.001	Reject H_{o2}
Pre-Following Instructions Post-Following Instructions	41.8***	0.001	Reject H_{o2}
Pre-On-Task Behavior Post-On-Task Behavior	53.6***	0.001	Reject H_{o2}

Note: ***p<0.01 (Very Highly Significant); **p<0.01 (Highly Significant); *p<0.05 (Significant)

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IV. SUMMARY, FINDINGS, CONCLUSIONS, AND RECOMMENDATIONS

Summary

This study aimed to determine the effectiveness of the Concrete–Pictorial–Abstract (CPA) approach in strengthening Grade 1 pupils' focus and learning retention in Mathematics at a selected school in Ozamiz City during the school year 2025–2026. Specifically, it examined the pupils' performance in Mathematics before and after the implementation of the CPA approach, their level of learning retention before and after its implementation, and the significant differences in both performance and learning retention before and after the intervention. The study focused on Grade 1 pupils to determine how CPA-based instruction influences early mathematical understanding and engagement in learning.

Findings

This study yielded the following findings:

1. The performance of Grade 1 pupils in mathematics before the implementation of the CPA approach was fairly satisfactory.
2. The performance of Grade 1 pupils in Mathematics after the implementation of the CPA approach was outstanding.
3. The level of learning retention of Grade 1 pupils in Mathematics before the implementation of the CPA approach was low.
4. The level of learning retention of Grade 1 pupils in Mathematics after the implementation of the CPA approach was very high.
5. There was a very highly significant difference in the pupils' performance before and after the implementation of the CPA approach.
6. There was a very highly significant difference in the pupils' learning retention before and after the implementation of the CPA approach across all constructs.

Conclusions

Based on the findings of the study, the following are the conclusions:

1. Grade 1 pupils demonstrate only basic mathematical performance before the implementation of the CPA approach.
2. Grade 1 pupils achieve outstanding Mathematics performance after exposure to the CPA approach.
3. Grade 1 pupils exhibit low learning retention in Mathematics before CPA-based instruction.
4. Grade 1 pupils demonstrate very high learning retention in Mathematics after the CPA approach is implemented.
5. The CPA approach significantly improves pupils' Mathematics performance.
6. The CPA approach significantly enhances pupils' learning retention in Mathematics.

Recommendations

Based on the findings and conclusions of the study, it is recommended that:

1. Grade 1 Mathematics teachers integrate the CPA approach consistently in daily lessons by using concrete materials, pictorial representations, and abstract exercises to enhance pupils' understanding and engagement.
2. School administrators provide instructional materials such as manipulatives, visual aids, and learning kits to support effective CPA implementation in early grade classrooms.
3. School heads conduct regular training and seminars for teachers focusing on CPA-based instructional strategies to improve teaching effectiveness in Mathematics.
4. Teachers design structured lesson activities that progressively move from concrete to pictorial and abstract representations to strengthen pupils' conceptual understanding.
5. Parents reinforce classroom learning by engaging pupils in simple home-based activities such as counting objects, drawing representations, and practicing basic number concepts.
6. Future researchers conduct similar studies in other grade levels or subject areas to further validate the effectiveness of the CPA

approach in improving learning outcomes and retention.

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