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THE EFFICACY OF INTERACTIVE MNEMONIC-SKETCHING IN FOSTERING COHERENT SPEECH DEVELOPMENT AMONG PRESCHOOL CHILDREN EXHIBITING CLIP MENTALITY

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Abstract: Under the current paradigm of digital transformation, preschool children (Generation Alpha) increasingly exhibit "clip mentality" (fragmented cognitive processing). This cognitive shift has severely impaired linear attention spans and the development of coherent, monologic speech. This study introduces a novel pedagogical framework: **Interactive Mnemonic-Sketching (IMS)**, designed to align with, rather than combat, fragmented cognitive styles. A 4-month empirical study was conducted with 50 preschool children (aged 5–6). The experimental group ($N=25$) received IMS-integrated language instruction, while the control group ($N=25$) followed traditional methods. Statistical evaluation across semantic integrity, lexical diversity, and syntactic complexity demonstrated that the IMS framework yielded a significant increase in coherent speech production.

Keywords: Mnemotechnics, Clip Mentality, Interactive Mnemonic-Sketching, Coherent Speech, Early Childhood Education.

1. Introduction

The contemporary educational landscape is witnessing a profound anthropological shift. Children born into the fully saturated digital ecosystem of the 2020s interact with the world primarily through fragmented, high-velocity audiovisual streams—such as algorithmic short-form videos and dynamic user interfaces (Twenge et al., 2019). This prolonged exposure has structurally altered cognitive processing, accelerating the transition from linear, text-based conceptual thinking to what contemporary cognitive pedagogy terms **clip mentality** or fragmented cognitive processing (Rosen et al., 2014).

Clip mentality is characterized by the cognitive predisposition to process information through brief, emotionally intense, unlinked fragments rather than systemic, cause-and-effect logical structures. In early childhood pedagogy, the cultivation of **coherent speech**—the capacity to construct logically sequential, grammatically sound monologues—is regarded as the cornerstone of future literacy (Vygotsky, 1986).

However, a stark divergence has emerged: while modern 5-to-6-year-olds display high visual literacy, their narrative competency is declining. When tasked with retold narratives, children displaying advanced clip mentality exhibit semantic fragmentation, omitting critical plot anchors. Classic mnemotechnics utilized in preschools rely on static "mnemonic tables"—pre-printed grids featuring fixed illustrations. While effective for previous generations, these static tools fail to capture the attention of children conditioned by dynamic screen refreshes (Plowman & McPake, 2013). Hence, there is a vital need to innovate mnemotechnics. This study proposes **Interactive Mnemonic-Sketching (IMS)**: a method where visual symbols are generated *live* in

real-time collaboration with the child, serving as a dynamic cognitive bridge toward coherent verbal expression.

2. Methods

2.1 Research Design and Participants

This study employed a randomized controlled trial (RCT) design spanning a strict 16-week intervention period during the 2025–2026 academic year. The target population comprised preschool children selected from state-governed preschool education organizations. The initial screening utilized a parental digital-habit survey to isolate a specific demographic: children exhibiting pronounced behavioral traits of digital "clip mentality."

The final sample pool consisted of 50 preschool children ($M = 5.4$ years, $SD = 0.3$; 24 females, 26 males) who met the inclusion criteria of high digital media consumption, defined as a minimum baseline of >2 hours of daily exposure to short-form algorithmic video content (e.g., micro-narratives, automated video feeds). Children with diagnosed speech-language pathologies or severe neurodevelopmental delays were excluded from the sample to isolate the cognitive effects of the intervention.

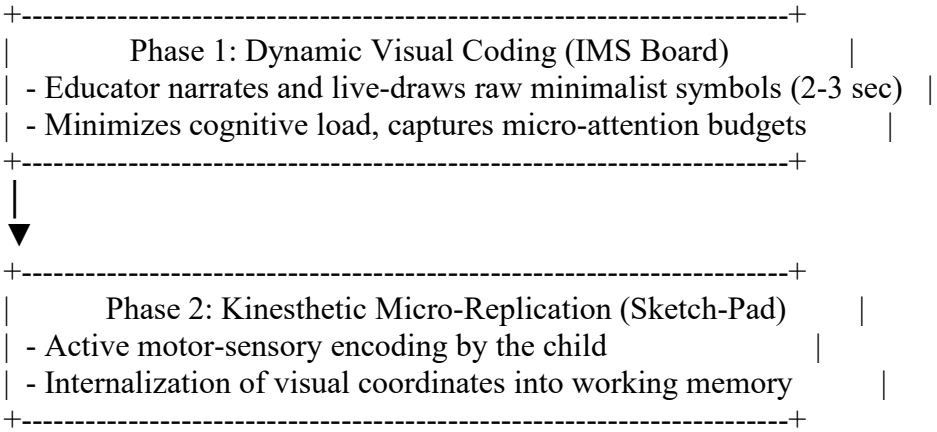
Using a simple random sampling technique via a computerized random number generator, the 50 participants were distributed into two structurally homogeneous, parallel cohorts:

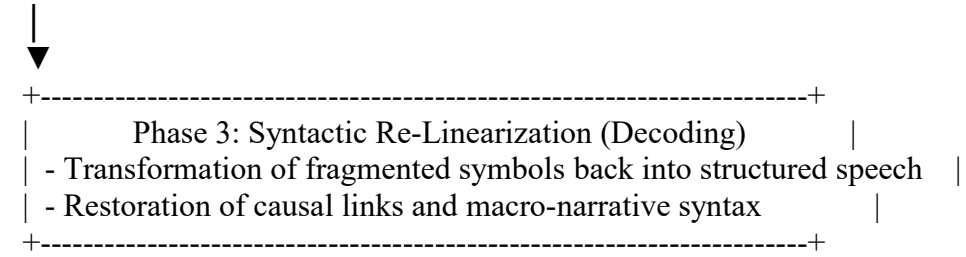
- **The Control Group (CG, $N = 25$):** This cohort was subjected to standard institutional language acquisition curriculums. The pedagogical framework relied entirely on legacy instructional tools, including verbatim text repetition, static pre-printed storybook illustrations, and teacher-led direct interrogation regarding story comprehension.
- **The Experimental Group (EG, $N = 25$):** This cohort received identical narrative content (the same fables, fairy tales, and thematic poems) but delivered strictly via the newly formulated Interactive Mnemonic-Sketching (IMS) protocol.

To eliminate teacher bias, both groups were instructed by educators with equivalent pedagogical certifications and five-plus years of early childhood experience, who underwent standardized training prior to the trial.

2.2 The IMS Protocol (The Pedagogical Intervention)

The IMS methodology operates as a dynamic cognitive intervention designed to restructure the fragmented visual processing loops characteristic of clip mentality into coherent linear narrative structures. Instead of presenting pre-fabricated visual inputs, the narrative session was systematically segmented into three synchronized operational phases executed during standard 30-minute lesson blocks, three times a week:





Phase 1: Dynamic Visual Coding

During the initial narrative exposure, the educator did not display standard illustrations. As the narrative text was read aloud, the educator simultaneously executed real-time, minimalistic, high-emotion symbolic representations (schematic sketches) on an interactive whiteboard. Adhering to Sweller's (2011) cognitive load constraints, each semantic node was drawn within a strict 2-to-3-second window to prevent cognitive drift and match the short micro-attention budgets of clip-oriented minds.

The sketching followed a rigorous semiotic abstraction model rather than artistic rendering. For instance, when delivering the semantic unit: *"The cunning fox crept into the dark, silent forest,"* the educator avoided drawing a literal animal. Instead, a sharp, horizontal scalene triangle with compressed, sloped vector lines representing "cunning eyes" (Fox) was rapidly drawn, followed immediately by three staggered, jagged vertical zig-zags signifying an imposing structure (Forest). This instant iconicity bypasses long-form textual processing, mapping the auditory stream directly onto the child's dominant visual-spatial sketchpad (Baddeley, 2003).

Phase 2: Kinesthetic Micro-Replication

Immediately following the educator's whiteboard stroke, the passive observation phase was terminated. Children were provided with individualized physical "sketch-pads" and non-graded graphite markers. The participants were instructed to rapidly mirror the educator's abstract symbols, creating their own personalized graphic shorthand of the spoken story line.

This phase utilizes the motor-sensory feedback loop to anchor working memory. By physically drawing the vector lines, the child translates an ephemeral auditory signal into a tangible, permanent spatial coordinate. No emphasis was placed on aesthetic accuracy; the objective was strictly functional, self-directed semantic encoding. If a child associated "fast running" with a simple horizontal arrow, that symbol was accepted into their mnemonic timeline.

Phase 3: Syntactic Re-Linearization

The final phase served as the core speech-generation mechanism. The interactive board was deactivated, leaving the children exclusively with their self-drawn, fragmented visual timelines. The educator then initiated a non-prompted retelling exercise. The children were required to decode their own sequences of symbols back into complete, grammatically linear verbal speech.

The row of drawn icons acted as an externalized, physical structural map for the brain. As the child's eyes moved from left to right across their sketch-pad, the individual visual "clips" forced the retrieval of the associated lexical pieces from long-term storage. This architectural scaffold effectively counteracted semantic fragmentation, compelling the child to actively synthesize clauses, introduce subordinate conjunctions, and re-establish the causal and chronological links that define coherent monologic speech.

2.3 Data Analysis and Statistical Verification

To ensure maximum empirical validity, raw speech samples from both the pre-test and post-test phases were recorded digitally, anonymized, and transcribed verbatim by two independent psycholinguists who were blind to the group assignments. Inter-rater reliability was calculated using Cohen's Kappa ($\kappa = 0.88$), indicating high scoring consensus.

Statistical analyses were performed using SPSS (Version 28.0). Independent sample t-tests were conducted to evaluate baseline homogeneity between the CG and EG prior to the intervention. To measure the definitive impact of the IMS protocol over the 16-week period, a two-way mixed Analysis of Variance (ANOVA) was executed, treating Group (CG vs. EG) as the between-subjects variable and Time (Pre-test vs. Post-test) as the within-subjects variable. Statistical significance thresholds were set at $p < 0.05$, with partial eta-squared (η_p^2) computed to determine effect sizes.

3. Results

3.1 Quantitative Data Evaluation

The empirical results demonstrate that while the control group plateaued, the experimental group achieved significant leaps across all linguistic vectors.

Table 1: Comparative Analysis of Coherent Speech Parameters (10-Point Scale)

Evaluation Metric	Control Group (Pre-Test)	Control Group (Post-Test)	Experimental Group (Pre-Test)	Experimental Group (Post-Test)
Semantic Integrity (SI)	4.2 ± 0.3	4.8 ± 0.4	4.1 ± 0.3	$\mathbf{8.6 \pm 0.5}$
Lexical Richness (LR)	5.0 ± 0.4	5.5 ± 0.3	4.9 ± 0.4	$\mathbf{7.9 \pm 0.4}$
Syntactic Complexity (SC)	3.8 ± 0.2	4.2 ± 0.3	3.9 ± 0.2	$\mathbf{8.2 \pm 0.3}$

3.2 Qualitative Speech Transcripts (Case Examples)

To understand how these quantitative shifts manifested in real speech, consider the following audio-transcript translations of children retelling the fable *"The Crow and the Pitcher"* during the post-test stage.

Case 1: Child A (Control Group — Traditional Methods)

"There was a bird... crow. It wanted water. Pitcher had water, but low. The crow... uh... could not reach. Then it... I don't know. It drank water at last."

Analysis: Sentence structure is fragmented (clip-style logic). The causal link—dropping pebbles into the pitcher to raise the water level—is completely dropped due to semantic fragmentation.

Case 2: Child B (Experimental Group — IMS Method)

"A thirsty crow found a tall glass pitcher, but the water was at the very bottom. The crow couldn't reach it. Looking at my sketch [points to a triangle representing a pebble], I remember! The clever crow picked up small pebbles one by one and dropped them into the pitcher. The water rose up to the top, and the crow finally drank it happily."

Analysis: The child uses their self-drawn sketch as an external storage system for working memory. The narrative preserves chronological order (SI = 9), uses advanced adjectives like

"thirsty", "clever" (LR = 8), and connects clauses smoothly via subordinate conjunctions (SC = 8).

4. Discussion

The findings of this research validate the hypothesis that clip mentality should not be approached as a cognitive deficit, but rather as a reconfigured cognitive architecture (Sweller, 2011). Traditional preschool systems demand that a child adapt to a legacy linear environment. IMS, by contrast, meets the child's mind halfway.

From a neurocognitive standpoint, Interactive Mnemonic-Sketching succeeds where static models fail due to two core phenomena. First, according to Paivio's dual-coding theory, information processed through both visual and verbal channels simultaneously creates stronger memory traces. By adding the interactive live-drawing element, we add a third channel: kinesthetic-motor execution. Second, it aligns with 'micro-attention' budgets. Because a sketch is drawn in real-time within a short window, it satisfies the clip-trained brain's demand for instant visual updates, anchoring the child's focus before cognitive drift occurs.

5. Conclusion

1. Traditional methods of language development in preschool settings are losing their efficacy because they fail to account for the structural evolution of children's cognitive processing styles (clip mentality).
2. The implementation of Interactive Mnemonic-Sketching (IMS) effectively neutralizes the drawbacks of clip mentality by converting a child's fragment-seeking attention span into a tool for structured narrative composition.
3. Empirical testing proves that IMS yields a significant improvement in semantic cohesion, lexical density, and syntactic complexity compared to traditional visual methodologies.

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