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Drawing with YouTube in Early Childhood: Cognitive Outcomes and Pedagogical Implications

Samsul Alam [1], **Rahmat Yusny** [2]
[1]Universitas Telkom, Indonesia, [2]University of Southern Queensland, Australia

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Abstract

This study explores the role of drawing with YouTube in enhancing cognitive development among early childhood learners. Using an instrumental qualitative case study in one public kindergarten (TK Negeri Pembina Semarang) comprising eight classes with 138 children aged 4–6 years and nine teachers, data were collected through classroom observations, teacher interviews, and analysis of children's drawings. The findings indicate that guided drawing with YouTube tutorials improved children's observational accuracy (e.g., identifying geometric forms), stimulated collaborative creativity (e.g., divergent colour use), and fostered problem-solving skills (e.g., adaptive material substitution). These results suggest that drawing with YouTube serves as an effective visual learning medium supporting early cognitive and creative growth through multimodal engagement. In the global discourse on digital childhoods, this study provides evidence that structured digital use can transform screen media from passive consumption into active cognitive engagement. It contributes to worldwide discussions on multimodal literacy and digital creativity as essential competencies for young learners. However, the study is limited by its single-site context and lack of longitudinal analysis. Future research should include broader samples, cross-cultural comparisons, and quantitative validation to deepen understanding of the cognitive impacts of digitally mediated drawing activities. Practically, the findings highlight the pedagogical value of integrating short, guided YouTube videos with open-ended questioning to enhance visual literacy, reflective thinking, and creative autonomy in early childhood classrooms.

Introduction

The rapid advancement of digital technology has transformed the landscape of education, particularly in early childhood learning. The integration of digital media has become essential in shaping children's cognitive and creative capacities. According to the Multimedia Learning Theory, effective learning occurs when information is presented through multiple channels (text, image, and sound) that work together to reinforce conceptual understanding (Mayer, 2024). Similarly, visual culture theory emphasises that digital imagery now mediates how young learners experience and make sense of the world (Mirzoeff, 2009). Visual digital media are not merely instructional tools but cultural artefacts that shape perception, imagination, and learning. Studies reveal that visual-based learning environments enhance cognitive engagement and reflective thinking (Gee, 2017). Consequently, visual media have evolved from supplementary aids to core pedagogical components that define the learning process itself.

Among various visual media, YouTube has emerged as a central platform intersecting entertainment, communication, and education. It offers vast learning potential for children while posing challenges related to content quality and media literacy (Henderson et al., 2024). Research shows that age-appropriate visual and linguistic content on YouTube can enhance vocabulary, imagination, and comprehension (Gowenlock et al., 2024), while unregulated exposure may reduce attention and critical thinking. In STEM and art contexts alike,

educationally designed YouTube videos foster higher engagement and knowledge retention than traditional instruction (Lijo et al., 2024). This duality positions YouTube as both a pedagogical opportunity and a developmental concern, requiring a critical understanding of how its multimodal potential can be optimised for early learning.

The effectiveness of YouTube as an educational tool aligns with the Cognitive Theory of Multimedia Learning and the DP4SET framework (Huang et al., 2024; Mayer, 2024), which emphasises multimodal engagement. By combining verbal and visual modes, YouTube facilitates comprehension and long-term retention while supporting children's natural inclination toward exploration and visualisation. Its participatory nature also reflects Vygotsky's notion of social learning through mediated tools, allowing observation, imitation, and interaction (Vygotsky, 1980). In early art education, this multimodal engagement supports creative exploration through drawing, helping children connect perception and imagination in meaningful ways.

In the Indonesian context, YouTube has become a dominant visual platform among children, functioning as both an entertainment and learning medium (Alam & Sunarto, 2024). Its accessibility enables teachers and parents to integrate visual examples into lessons, from simple drawing tutorials to animated storytelling. When applied purposefully, YouTube can nurture visual-spatial reasoning, symbolic understanding, and problem-solving (Berk, 2018; Cerovac & Keane, 2025). Within drawing activities, YouTube not only provides visual references but also stimulates imagination and creative reinterpretation. Such integration situates learning within children's real-life visual environments, making art education more relevant to their social and cultural experiences.

Drawing is a fundamental mode of expression in early childhood that supports both cognitive and emotional development. Children's drawings reveal how they interpret relationships, space, and emotion, reflecting their developmental understanding of the world (Paz-Baruch et al., 2025). As a natural form of expression for young children, they serve as a crucial medium for cognitive and emotional development. Through drawing, children externalise imagination and construct visual narratives that bridge perception and cognition. When supported by drawing with YouTube, this process becomes enriched by diverse visual inputs that stimulate observation and creative reasoning. Thus, digital drawing experiences can strengthen cognitive pathways that connect imagination, critical analysis, and expression.

Children's artwork also reflects their sociocultural environment, depicting family life, local values, and cultural symbols (Wakayama, 2025). Incorporating YouTube in drawing situates art learning within broader visual culture, where online imagery becomes part of children's symbolic vocabulary. Exposure to diverse representations encourages children to interpret and recreate visuals through their cultural lens. This interdisciplinary approach aligns with contemporary educational models that emphasise visual literacy, inclusivity, and creativity (Purg et al., 2025). It transforms art learning from mere skill acquisition into a process of meaning-making and cultural reflection in the digital age.

Globally, art education has embraced technology-enhanced and interdisciplinary approaches connecting art with science, design, or social studies (Krautz, 2025). However, despite widespread digital integration, few empirical studies have examined how YouTube-based art activities influence early childhood drawing and cognitive development. Existing research tends to focus on language learning, emotional growth, or classroom engagement (Alam & Sunarto, 2024; Yuliastanti et al., 2024), leaving a significant gap in understanding YouTube's role as a cognitive tool in art learning. Most practices remain descriptive or aesthetic rather than analytical, highlighting the need for empirical evidence on how digital visual platforms foster observation, creative reasoning, and problem-solving.

Another pressing concern is the gap between children's visual exposure and their visual literacy. In today's image-saturated digital environment, children consume vast amounts of online visuals but are rarely guided to analyse them critically (Guo et al., 2020). Passive consumption can lead to cognitive stagnation, encouraging imitation rather than inquiry (Mann

et al., 2025; Muppalla et al., 2023; Swider-Cios et al., 2023). Art education, particularly drawing, can transform this passive visual experience into active visual thinking, fostering perception, interpretation, and creative reimagination (Alghufali, 2024). Therefore, drawing with YouTube offers a promising framework for bridging the cognitive and cultural divide, turning children from visual consumers into creative visual thinkers.

Based on these considerations, the present study explores the role of drawing with YouTube in enhancing children's cognitive development. It investigates how engaging with drawing tutorials on YouTube can stimulate observation skills, critical and creative thinking, and problem-solving. By examining YouTube as both a pedagogical medium and a cultural artefact, this research contributes to the discourse on digital literacy and art education in early learning. The findings are expected to provide insights into how digital visual media can be effectively integrated into art-based pedagogy to support holistic cognitive growth, creativity, and cultural awareness in the digital era.

Despite the growing use of digital platforms in early learning, empirical evidence remains limited regarding how YouTube-based art activities specifically shape cognitive mechanisms in young children. To address this gap, the present study examines how drawing with YouTube mediates three interrelated domains of cognition (observation, creativity, and problem-solving) among early childhood learners. Methodologically, it applies an instrumental qualitative case study in a public kindergarten context to capture authentic classroom dynamics. By conceptualising YouTube simultaneously as a pedagogical medium and a cultural artefact, the study contributes to theoretical integration across Multimedia Learning Theory (Mayer, 2024), Sociocultural Mediation (Vygotsky, 1980), and Cognitive Flexibility Theory (Spiro et al., 1992). The findings are expected to deepen understanding of how digital visual media can be strategically embedded in art-based pedagogy to support holistic cognitive growth, creative autonomy, and cultural awareness in the digital era.

Methods

Research Design

This study employed a qualitative case study design with an instrumental orientation (Stake, 1995; Yin, 2018). The instrumental case study approach was chosen because the research aimed not only to describe a single case but to explore broader insights into how drawing with YouTube supports children's cognitive development. The case of TK Negeri Pembina Semarang was selected as a representative context that could illuminate the integration of digital visual culture into early childhood art education. This design enabled a comprehensive, contextually grounded exploration of the research question: "What is the role of drawing with YouTube in children's cognitive development?"

To operationalise this question, the following sub-questions were formulated:
1. How do children demonstrate observing skills when engaging with drawing on YouTube?
2. How do these activities stimulate critical and creative thinking?
3. In what ways do drawing with YouTube sessions encourage problem-solving behaviours in children's artistic processes?

These operational questions guided data collection, coding, and interpretation throughout the study.

Participants and Sampling

The study involved 138 children aged 4–6 years from eight early childhood classes (Groups A and B), along with nine teachers who facilitated the drawing sessions. Participants were selected using purposive sampling, based on the following criteria: (1) schools that had implemented drawing activities using YouTube as visual reference material, and (2) teachers who were actively involved in art learning activities. The sample was balanced in gender (approximately 52% girls and 48% boys) and represented a mix of urban and suburban learners.

A research permit was obtained from the Head of TK Negeri Pembina Semarang. Written consent was collected from school principals, teachers, and the children's parents or guardians.

Participants were informed about the study's objectives, voluntary participation, and confidentiality. Pseudonyms were used to protect participant identities.

Research Procedures

Data collection was conducted over six weeks through four main stages. The preliminary stage involved coordinating with school administrators, introducing the study, and obtaining participants' consent. This was followed by semi-structured classroom observations twice a week, documented through field notes and photographs. After each observation cycle, interviews with teachers were conducted and selected children's drawings were collected for analysis. In the final stage, data from observations, interviews, and documents were triangulated and reflected upon to validate emerging patterns.

The procedural flow is visually summarised in Figure 1, titled Conceptual Model of Research Flow, which illustrates how data collection and analysis were interconnected through interpretive reflection. The figure was initially designed by the researcher and conceptually adapted from an interactive model (Miles et al., 2014). Each stage, case identification, interpretive analysis, finding synthesis, and conclusion development, represents iterative processes in qualitative interpretation.
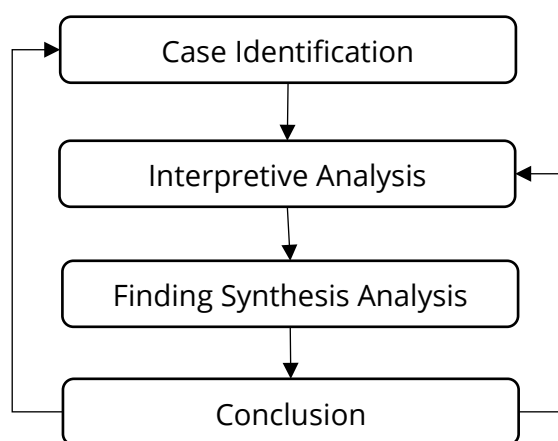

Figure 1. Conceptual Model of Research Flow

Data Collection Instruments

The data collection process employed three primary instruments to capture a comprehensive understanding of the research context. The first instrument was an observation sheet, designed in a semi-structured format to document children's cognitive behaviours, such as creativity, problem-solving, and critical thinking, during drawing activities, as well as patterns of interaction and engagement. The second instrument was a semi-structured interview guide used to gather insights from nine teachers on their perceptions of YouTube's role in learning. Each interview lasted 30-45 minutes and was audio-recorded with prior consent. The third instrument was a documentation checklist that included children's drawings, lesson plans, and teacher journals, in which the drawings were analysed for cognitive indicators. In contrast, the journals provided contextual and reflective information. All instruments were piloted before fieldwork to ensure clarity and consistency.

Data Analysis Techniques

Data were analysed using the interactive model (Miles et al., 2014), consisting of three concurrent components. The first component was data reduction, in which transcripts, field notes, and visual documents were reviewed and coded inductively from the raw data, while remaining guided by theoretical perspectives on cognitive development (Piaget & Inhelder, 1956; Saracho, 2023). The second component involved data display, in which emerging patterns were organised into matrices and visual maps to illustrate the relationships between drawing with YouTube and cognitive indicators such as observing, critical, creative, and problem-solving

skills. The third component was conclusion drawing and verification, during which themes were refined through iterative comparison and theoretical triangulation.

The coding process combined inductive category formation with deductive theoretical mapping. Theories of child cognitive development and constructivism (Cade et al., 2022; Cerovac & Keane, 2025) guided interpretation, ensuring that analytical categories were aligned with developmental frameworks.

Trustworthiness and Researcher Positioning

To ensure the credibility and dependability of the findings, the study employed several validation strategies. Triangulation was conducted by cross-verifying data from observations, interviews, and documentation. Member checking allowed participating teachers to review and confirm preliminary interpretations, while peer debriefing involved external qualitative research experts assessing the consistency of data coding.

Additionally, an audit trail was maintained by systematically archiving field notes, coding schemes, and analytic memos to ensure transparency. The researcher also practised reflexivity by keeping a reflective journal to acknowledge personal biases, positionality, and interpretive decisions. Collectively, these strategies enhanced the methodological rigour and ensured that the findings authentically represented participants' experiences within the educational context.

Result

Drawing activities in TK Negeri Pembina Semarang, which begin with YouTube video viewing, revealed salient patterns indicating meaningful contributions to children's cognitive development. Classroom observations and teacher interviews provided evidence that these activities stimulated attention, visual analysis, and problem-solving during drawing sessions. The videos are carefully selected to align with the learning themes and serve as a stimulus for children to observe, process, and then express what they have seen through drawing (Figure 2).
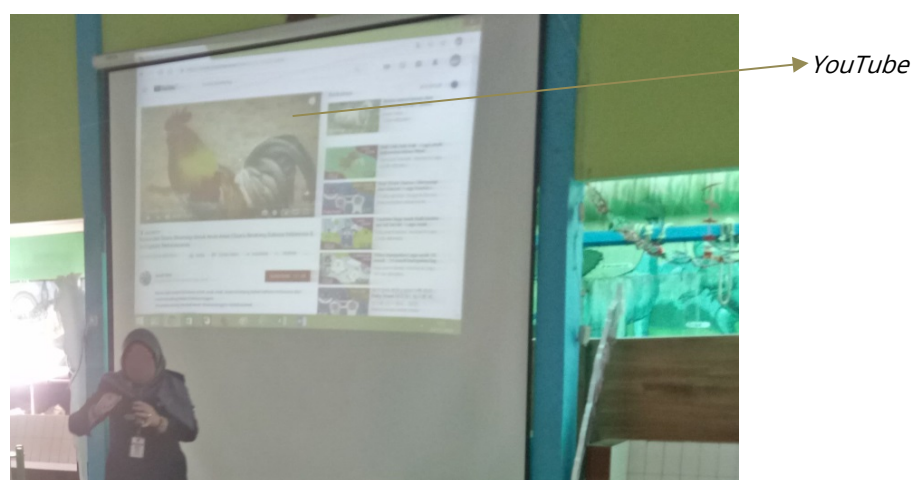

Figure 2. Use of YouTube in Art Learning Activities

The analysis integrates evidence from classroom observations, teacher interviews, and transcripts of children's dialogues and artworks. To capture the complexity of cognitive development through drawing on YouTube, the results are organised into three representative cases that illustrate distinct cognitive dimensions: observation and conceptualisation (Case 1), creative collaboration (Case 2), and problem-solving and adaptability (Case 3).

Case 1: Observation to Conceptual Understanding

During the thematic session "My Favourite Animal," "K" appeared hesitant and told her teacher,

"K cannot draw a rabbit, Teacher."

This moment initiated a guided re-observation process using a YouTube video of a rabbit. The teacher encouraged analytical noticing:

> Teacher : "What shape does a rabbit's head look like?"
> Kia   : "A circle, Teacher."
> Teacher : "Now, what about the long one on top of the head?"
> Kia   : "Oval, Teacher."

After identifying geometric correspondences (a circle for the head, an oval for the ears), "K" was able to reconstruct the rabbit with confidence. This episode demonstrates how visual observation evolved into conceptual mapping, combining perceptual and analytical reasoning.
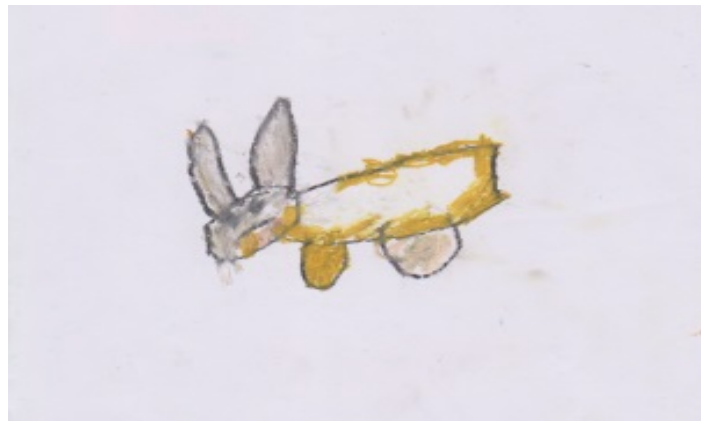

Figure 3. The Rabbit Object Drawn by "K"

Observation data confirmed that several other children began to verbalise what they saw ("it is brown," "it is long ears"), an indicator of symbolic learning. Teachers recognised this pattern as a shift toward structured visual analysis:

> "Children could mention forms after watching. YouTube helps them describe what
> they see using language and logic." (Teacher "M")

The process reflects the transition from intuitive to symbolic representation. Here, the YouTube visual stimulus served as a cognitive scaffold, helping children internalise spatial reasoning through art. "K's" progression reveals that guided visual observation fosters analytical thinking. The teacher's scaffolding transformed a perceptual task into a reflective process of problem decomposition and conceptual reassembly.

To validate and enrich the observational data from Case 1, these qualitative findings were examined through data triangulation. This triangulation involved synthesising direct observations, in-depth interviews with teachers, and the analysis of student-produced artwork. Table 1 below presents a summary of the verified data, which collectively confirms that the teacher-guided, YouTube-mediated visual observation acted as a catalyst for transforming initial perceptual confusion into a structured conceptual mapping. This process strengthens the case for cognitive scaffolding in facilitating the transition from intuitive representation to symbolic understanding.

Table 1. Data Triangulation of Case 1

Data Source	Key Evidence	Cognitive Interpretation
Observation	"K" initially failed to draw a rabbit, then succeeded after analysing shapes.	Integration of perception and concept
Teacher Interview	"Children can describe what they see on YouTube before drawing"	Mediated observation enhances symbolic reasoning
Child Transcript	"Circle, oval, semicircle"	Verbalisation of forms shows conceptual transfer

Case 2: Creativity and Collaborative Imagination

A second classroom episode involved two children, "A" and "H", who collaborated spontaneously during a drawing session following a YouTube animation of household pets (figure 4).

> H: "What are you drawing, A?"
> A: "I am drawing a cat."
> H: "I want to draw a cat too!"
> A: "I am using blue and yellow."
> H: "I am using red and blue."

Observation notes described that both children watched the same video but produced different representations (A's cat had wings, while H's had multi-coloured fur). Their interaction illustrates how peer dialogue stimulated creative divergence rather than replication (Figure 5). Teachers viewed such behaviour as a sign of independent artistic reasoning:

> "*Children make decisions by themselves about what colour to use, what to draw, and how to express it. They are no longer waiting for teacher instructions.*" (Teacher AP)

Figure 4. Two Children Collaborate to Draw Pets

The discussion between peers represents a social form of reflection, echoing the view of learning as socially mediated cognition. Rather than copying the YouTube model, both children personalised their images, integrating memory, imagination, and conversation.

> "*When children see something they like, they immediately draw it. But each drawing turns out differently.*" (Teacher PSM)

Figure 5. The cats depicted by "A" and "H" have a very similar appearance to the image objects because they were done collaboratively

Teachers also noted increased verbal exchange about design decisions, such as children questioning peers, justifying colour choices, and revising their work accordingly. This case

demonstrates how drawing on YouTube can stimulate collaborative creativity. Visual prompts served as starting points for shared imagination, turning the classroom into a dialogic art space where observation, narrative, and invention coexisted.

To validate the findings on collaborative creativity and divergent thinking, data from Case 2 were analysed through data triangulation. This process synthesised observations of peer interactions, teacher narratives of independent artistic reasoning, and analysis of drawing artefacts. Table 2 below summarises the verified data, indicating that the YouTube stimulus acted as a social catalyst. This transformed the drawing activity into a shared cognitive process that sparked creative divergence, confirming the role of learning as socially mediated cognition.

Table 2. Data Triangulation of Case 2

Data Source	Key Evidence	Cognitive Interpretation
Observation	Children designed different versions of the same animal, exchanging colour ideas.	Divergent thinking and aesthetic reasoning
Teacher Interview	"They no longer wait for instruction; they decide themselves"	Creative autonomy
Child Transcript	"I drew a blue cat so it could fly"	Imaginative reinterpretation of observed content

Case 3: Problem Solving and Cognitive Flexibility

The teacher structures lessons to encourage self-regulation and adaptive problem-solving. The teacher explains:

"When I show YouTube videos before drawing, children become more critical and often ask what to do next. They also find their own solutions when materials are limited." (Teacher AP)

During the observation, several children had crayons missing or difficulty mixing colours. Rather than waiting for help, they engaged in collective problem-solving:

Child 1: "I do not have any green."
Child 2: "Just mix blue and yellow."

The children's spontaneous solution demonstrated the transfer of experiential knowledge of colour theory, as previously observed in the YouTube video.

Teacher AP emphasised that this pattern was recurrent:

"*Children appear solution-oriented; they substitute tools and help friends. That is the most visible change after using YouTube.*"

In a later interview, Teacher AP reflected:

"*YouTube motivates creativity and makes children happy, but the key is in guiding them to reflect on why they choose something, how to improve.*"

Documentation of drawings revealed adaptive compositional choices: when a child lacked red, they replaced it with purple while maintaining design balance. Teachers described this as "thoughtful improvisation," evidence of metacognitive regulation emerging through visual practice. Problem-solving in this case emerged as distributed cognition knowledge co-constructed among peers, mediated by the teacher, and reinforced by YouTube's multimodal cues.

To verify the self-regulation and adaptive problem-solving phenomena in Case 3, the case study data were examined through data triangulation. This process synthesised teacher narratives about student initiatives, observations of collaborative problem-solving (tool/colour substitution), and analysis of image artefacts. Table 3 below summarises the verified data, which confirms that the YouTube-mediated learning structure facilitated metacognitive regulation and distributed cognition through visual practices.

Table 3. Data Triangulation of Case 3

Data Source	Key Evidence	Cognitive Interpretation
Observation	Children re-watched the video, adapted when lacking tools	Reflective and adaptive cognition
Teacher Interview	"Children use alternative colours and share materials"	Cognitive flexibility and cooperation
Child Transcript	"Just mix blue and yellow"	Peer-supported problem-solving and reasoning

Cross-Case Analysis

While each case highlights specific aspects of cognitive engagement, the comparative synthesis reveals overlapping developmental mechanisms. These mechanisms collectively demonstrate the substantial cognitive potential of mediated drawing with YouTube. Table 4 below presents a cross-case comparison summarising the dominant cognitive processes and core mechanisms identified. This comparison confirms that the use of digital media in art education creates a cognitive continuum in which skills reinforce one another recursively.

Table 4. Cross-Case Comparison of Findings

Case	Dominant Cognitive Process	Supporting Data Sources	Core Cognitive Mechanism
Case 1	Observation to conceptualisation	Child transcript, observation, teacher commentary	Visual-symbolic mapping
Case 2	Collaboration to creative divergence	Child dialogue, teacher interview	Socially mediated creativity
Case 3	Resourceful adaptation to problem-solving	Observation, teacher reflection	Metacognitive flexibility

The process of deconstructing complex visual information begins with fundamental analytical skills, encapsulated by Perceptual Grounding (Case 1). In this stage, children demonstrate an emerging capacity for analytical reasoning by spontaneously breaking down intricate visuals into their basic geometric components. This foundational ability to perceive and analyse structure is critical, providing the cognitive basis for advanced visual comprehension and interpretation across artistic media.

Building upon individual perception, the learning environment is significantly enhanced by peer interaction, which drives Social Imagination (Case 2). Through focused dialogue and shared activity, children's reflective creativity is stimulated. The act of drawing transcends a solitary exercise, evolving into a collaborative inquiry in which ideas, feedback, and shared exploration enrich creative output and deepen understanding of visual concepts within a social context.

Finally, the execution of art-based tasks serves as a dynamic arena for developing Cognitive Flexibility (Case 3). When faced with unexpected constraints or planning challenges, children's adaptive responses become evident. This need to adjust, reassess, and find alternative solutions demonstrates that art-based tasks are highly effective in fostering essential executive functions, such as planning, monitoring, and robust problem-solving, necessary for navigating real-world complexities. Together, these cases portray drawing as a multi-layered cognitive act encompassing perception, reasoning, and imagination. YouTube does not merely display images; it mediates thinking, enabling children to shift between observing, interpreting, and reconstructing meaning.

Discussion

This study makes theoretical contributions by expanding the understanding of how digital media, specifically YouTube, can serve as a mediating tool in early childhood cognitive development. The findings of this study strengthen and expand theories such as the Cognitive Theory of Multimedia Learning (Mayer, 2024), Sociocultural Theory (Vygotsky, 1980), and

Cognitive Flexibility Theory (Spiro et al., 1992), by demonstrating that drawing with YouTube not only enhance visual perception but also encourage analytical, reflective, and adaptive thinking in the context of art learning.

In practice, this study offers an arts-based learning model that early childhood education teachers can implement to enhance children's higher-order thinking skills, such as critical observation, collaborative creativity, and problem-solving. By integrating pedagogically selected YouTube videos and guided verbal interactions, teachers can create a multimodal learning environment that supports holistic cognitive development. These findings also provide a basis for developing more reflective and metacognitive-based digital arts teacher training and curricula.

These findings can be conceptualised as progressive stages of cognitive engagement in drawing with YouTube.
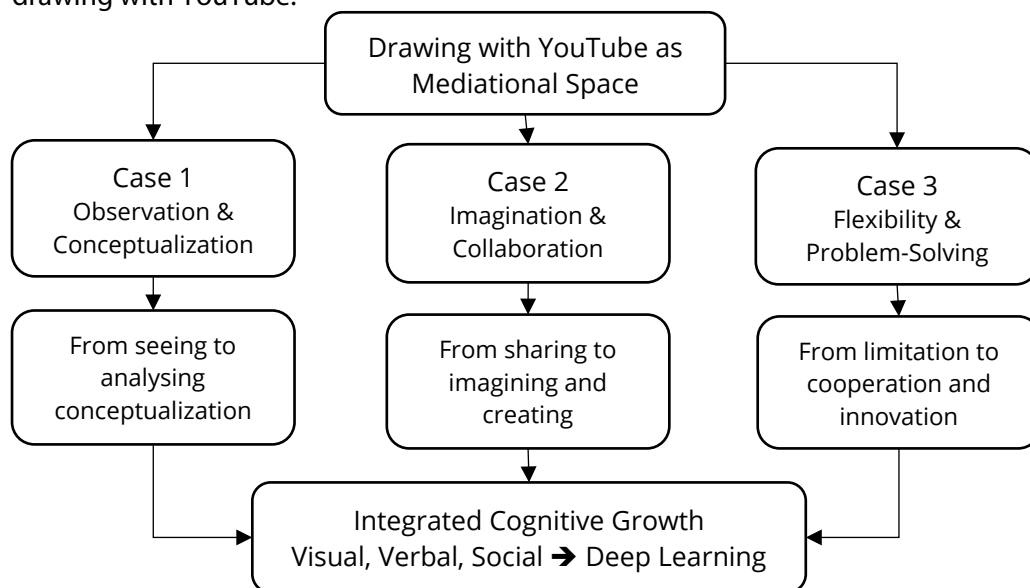

Figure 6. Stages of Cognitive Development in Drawing with YouTube

From this central mediational role, three distinct yet interrelated cases illustrate progressive stages of children's cognitive engagement. The first stage, observation and conceptualisation, reflects how guided observation supports analytical thinking through processes of assimilation and accommodation (Piaget, 1952) and dual modality processing (Mayer, 2024)—enabling children to move from perceptual awareness toward conceptual reasoning. The second stage, imagination and collaboration, highlights how social interaction transforms shared visual input into individual creative output, consistent with Vygotsky's sociocultural perspective (Vygotsky, 1980) and Eisner's emphasis on reflective decision making (Eisner, 2002). The third stage, flexibility and problem-solving, demonstrates how collaborative adaptation under resource constraints mobilises distributed cognition (Sannino & Engeström, 2018) and fosters cognitive flexibility (Spiro et al., 1992), enabling children to navigate challenges and generate solutions within their artistic processes.

Overall, drawing with YouTube constructs a triadic cognitive ecology which is visual, verbal, and social. Visual inputs stimulate perception, verbal mediation refines reasoning, and social collaboration fosters imagination and adaptability. This interconnected process transforms digital media into a multimodal learning space, where art serves as a bridge between sensory experience and cognitive development (figure 7).
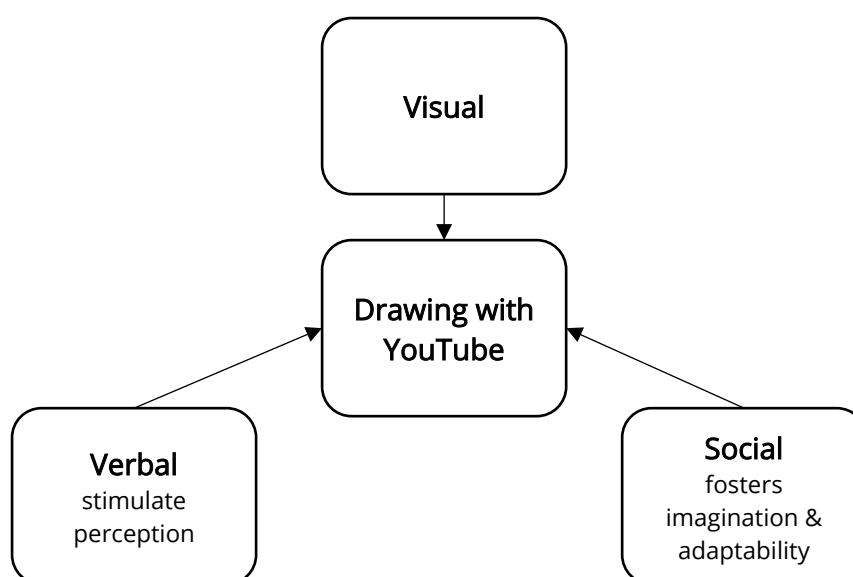
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Figure 7. Triadic Cognitive Ecology in Drawing with YouTube

The Role of Drawing with YouTube in Stimulating Observation Skills

This section emphasises that drawing with YouTube can develop children's observation skills from mere observation to conceptual analysis. In case study 1, when "K" said, "I cannot draw a rabbit," the teacher guided with questions such as "What shape does it look like?" so that the child began to break down the rabbit shape into simple geometric elements such as circles, ovals, and semicircles. This process demonstrates that visual observation is not only a perceptual activity but also an analytical thinking process involving identification, categorisation, and visual reasoning.

This transformation reflects the principles of assimilation and accommodation from Piaget's theory of cognitive development (Piaget, 1952). Children assimilate new visual information (the picture of a rabbit) into their existing mental schema (knowledge of basic shapes). When new information does not fit into the existing schema, children accommodate by adjusting their thinking. Thus, drawing from a YouTube video serves as a means of forming new cognitive structures through guided observation.

Learning designs that combine YouTube videos with teacher-guided verbal instruction align with the principles of the Cognitive Theory of Multimedia Learning (Mayer, 2024). According to this theory, learning is more effective when information is received through two sensory channels: visual and auditory. In this context, children not only "see" the shapes but also "hear" instructions, explanations, and questions that help them understand them. This multimodal approach reduces cognitive load and fosters the formation of more stable mental representations. Thus, YouTube serves not as passive entertainment but as a cognitive scaffold that facilitates the development of observation, categorisation, and symbolization skills. This aligns with the view that artistic activities such as drawing serve as a "cognitive language" that allows children to express and understand the world through visual symbols (Lowenfeld & Brittain, 1964).

This process marks a significant shift from passive viewing to active visual analysis. Through teacher intervention, YouTube viewing is used as a semiotic (mediating) tool that encourages children to notice details, compare shapes, and connect observations to more abstract concepts. These findings suggest a contextual moderation rather than a direct contradiction to previous research indicating that excessive or unregulated digital media exposure may reduce children's focus (Muppalla et al., 2023). In this study, guided, short-duration, purpose-built YouTube sessions, supported by teacher co-viewing and dialogic questioning, appeared to sustain children's attention and reflective engagement. In fact, with targeted pedagogical strategies, YouTube can strengthen children's reflective attention and

working memory. These findings align with Sociocultural Theory (Vygotsky, 1980), which states that social interaction and teacher guidance within the Zone of Proximal Development (ZPD) enable children to transform visual observations into structured, analytical thinking.

Furthermore, this type of meditative activity improves children's executive functions, particularly attentional control and working memory, which are fundamental to the development of advanced observational skills (Sonter & Jones, 2018). Thus, drawing with YouTube repositions digital media from a distraction to a directed cognitive space that fosters observational skills, visual analysis, and the foundations of scientific thinking in children.

The Role of Drawing with YouTube in Fostering Critical and Creative Thinking

This section illustrates how peer interactions transform shared visual input from YouTube into diverse creative expressions. Although both children reference the same visual references, their verbal exchanges yield different artistic outcomes, demonstrating that dialogue fosters personal interpretation. This demonstrates that the essence of creativity in early childhood is not simply the ability to reproduce forms, but also to reinterpret them through imagination and social communication.

The conversation between "A" and "H" also reflects the core of Vygotsky's sociocultural theory (Vygotsky, 1980), where learning and creativity emerge through social mediation. By verbalising their ideas, children externalise thought processes and co-construct meaning, transforming imitation into co-creation. This process situates YouTube not as a solitary digital experience but as a shared cultural tool that stimulates collaborative imagination.

In this study, imagination operates as both an expressive and a cognitive practice, a form of reflective decision-making (Eisner, 2002). As children negotiate colour choices, shapes, and storylines with peers, they engage in acts of intellectual reflection and aesthetic judgment. Such dialogues demonstrate that creativity is not spontaneous but reflective and deliberative, involving cycles of choice, justification, and revision.

This finding resonates with the argument that narrative-based visual engagement stimulates imaginative reconstruction in early learners (Gil-Ruiz et al., 2025). However, this study extends that view by emphasising the mediated nature of creativity. Drawing with YouTube becomes most effective when accompanied by teacher scaffolding and peer discussion. The dialogic process turns digital imitation into creative discovery, enabling children to critically evaluate and modify their artistic decisions through reasoning rather than replication.

The role of drawing with YouTube in fostering critical and creative thinking lies in its ability to combine visual stimuli, reflection, and evaluation into a recursive process of synthesis and transformation. Creativity here operates at the intersection of perception (seeing), cognition (analysing), and imagination (reinterpreting). Through collaborative dialogue, children compare visual models, critique their own work, and adapt their strategies, engaging in the Creating and Evaluating levels according to Bloom's Digital Taxonomy (Churches, 2021).

Moreover, this process aligns with the view that digitally mediated art-making enhances cognitive adaptability (Alghufali, 2024). Exposure to YouTube visuals stimulates idea generation, while reflective dialogue promotes analytical judgment. The interplay between these two modes cultivates higher-order thinking skills: divergent thinking, reflective evaluation, and creative transformation. Hence, YouTube serves as a cultural and cognitive bridge, linking visual literacy to adaptive intellectual growth, enabling children to think critically, make creative decisions, and construct meaning collaboratively.

The Role of Drawing with YouTube in Encouraging Problem-Solving Skills

Case 3 provides an authentic illustration of how problem-solving skills emerge from children's interaction and collaboration within the context of limited resources. When one child expressed frustration, "I do not have green," another quickly suggested, "Mix blue and yellow." This spontaneous exchange represents more than technical colour knowledge; it demonstrates distributed cognition (Sannino & Engeström, 2018), where understanding is collectively constructed and shared through dialogue and cultural tools.

Here, YouTube functions as a mediating artefact that provides shared visual experiences, while peer collaboration transforms those experiences into actionable reasoning. Instead of perceiving the absence of a resource as an obstacle, children reinterpret it as an opportunity for experimentation. This adaptability marks the transition from procedural imitation to strategic thinking, in which knowledge becomes flexible, transferable, and context-sensitive.

The teacher's reflection captures a fundamental cognitive shift: children begin to exhibit cognitive flexibility, or the capacity to modify approaches when facing novel challenges. Such flexibility is central to deep learning, as it enables learners to restructure prior knowledge dynamically (Spiro et al., 1992). In the drawing with YouTube, this flexibility is activated through constraints that compel learners to explore alternatives, evaluate outcomes, and monitor their own reasoning.

Creating art within constraints fosters persistence and adaptive thinking, a process that pushes children beyond routine execution toward the development of reflective strategies (Alghufali, 2024). As they confront and solve creative problems, children engage in metacognitive monitoring, consciously evaluating their methods (Should I try another colour?) and their results (Does this look right?). This recursive evaluation signals the development of executive function, the foundation for higher-order thinking and self-regulated learning.

This study shows that drawing with YouTube facilitates problem-solving through a recursive cycle of observation, creation, reflection, and adaptation. This process begins with identifying a visual or material problem (e.g., colour limitations), continues with experimentation and evaluation (mixing colours, revising lines), and culminates in the formulation of a new strategy. This cyclical engagement mirrors the metacognitive cycle, where learners consciously shift between planning, monitoring, and evaluating their thinking processes (Sonter & Jones, 2018).

Moreover, YouTube serves as an epistemic tool (Yafie et al., 2020) that connects sensory input with reasoning. The digital reference provides initial visual data, while peer and teacher mediation transform that data into knowledge construction. Rather than diminishing focus as some studies suggest (Muppalla et al., 2023), the structured use of YouTube channels draws children's attention toward purposeful inquiry. Thus, drawing with YouTube fosters strategic adaptability and cross-cognitive transfer, enabling young learners to apply insights from one problem to another, a key attribute of 21st-century problem-solving competence.

The empirical model of drawing with YouTube and cognitive development (Figure 8) conceptualises this process as a recursive five-stage cycle: visual input, reflective interpretation, creative creation, evaluation and feedback, and reciprocal growth. Each stage demonstrates how aesthetic experience fosters reflective and adaptive cognition.
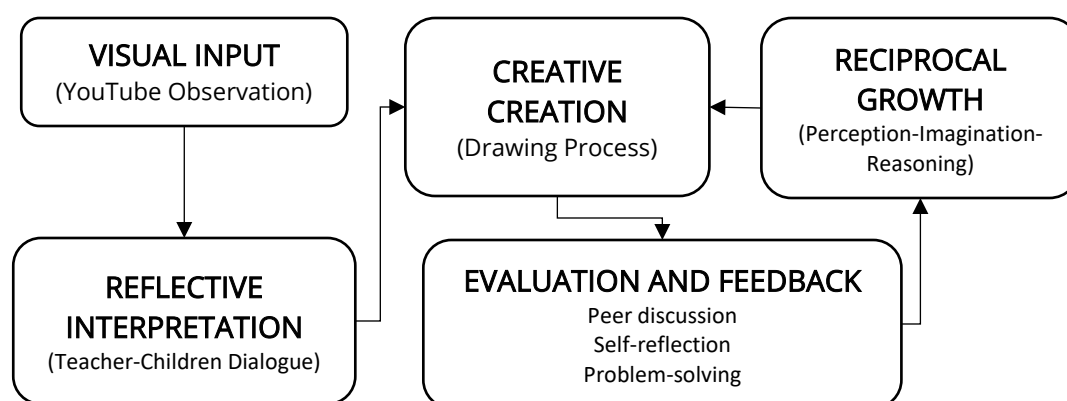
Figure 8. Empirical Model of Drawing with YouTube and Cognitive Development

This model conceptualises the learning-to-draw process as a five-stage iterative cycle that connects perception, reflection, and creation in a dynamic loop of cognitive development. It is

not a theoretical abstraction but an empirical synthesis derived from classroom evidence. The first stage, visual input, begins when children watch YouTube videos that stimulate their perception and introduce key visual concepts such as shape, colour, and composition. Next, during reflective interpretation, teacher–child dialogues help children interpret what they see, linking sensory experiences with abstract reasoning and developing their capacity for critical thought. The third stage, creative creation, occurs when children translate these insights into drawings that express their understanding, emotions, and ideas in tangible visual forms. The fourth stage, evaluation and feedback, allows learners to assess and refine their work through discussion and teacher guidance, promoting metacognitive awareness and the ability to revise thoughtfully. Finally, reciprocal growth emerges as an integrative phase where perception, imagination, and reasoning evolve together, underscoring that drawing is both an expressive act and a cognitive process that cultivates holistic intellectual development.

Conclusion

Drawing with YouTube is suggested to be an effective mediational tool that integrates observation, imagination, and adaptability to enhance children's cognitive development. Through guided interaction, it transforms passive viewing into analytical observation, promotes critical and creative thinking through collaboration, and strengthens problem-solving skills through adaptive reasoning. These findings affirm that art in digital contexts functions not only as aesthetic expression but also as a cognitive mechanism that cultivates 21st-century competencies, which are critical analysis, creativity, and flexibility in early childhood learning.

Despite its contributions, this study is limited by its small context, reliance on qualitative methods, and lack of systematic attention to emotional factors such as motivation and frustration. Future studies should broaden their scope, incorporate emotional variables, and employ a more diverse set of methods to enrich the understanding of children's learning dynamics. In practice, the findings highlight the pedagogical value of integrating YouTube into art-based learning. Using short, guided videos and open-ended questioning can enhance visual literacy, reflection, and creative autonomy. Future research should also examine cross-cultural, longitudinal, and comparative approaches and develop teacher-training models that position digital art as a reflective and metacognitive learning tool in early childhood education.

Declarations

Author Contribution Statement

Samsul Alam coordinated the overall research process and served as the lead author, responsible for drafting and preparing the manuscript. Rahmat Yusny conducted research evaluations, ensured the study's validity and reliability, performed data analysis, interpreted the findings to draw meaningful conclusions, and processed and organised the data, ensuring its accuracy and consistency. All authors contributed to the manuscript, reviewed its content, and approved the final version for submission.

Data Availability Statement

Data are available from the corresponding author upon reasonable request.

Declaration of Interests Statement

The author declares no conflict of interest.

Additional Information

No additional information is available.

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