Visual Art Language as a Cognitive Mechanism in the Development of Critical Thinking Skills Among Primary School Pupils

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ABSTRACT

Critical thinking has become one of the fundamental competencies emphasised in twenty-first century education. Despite the increasing recognition of higher-order thinking skills within educational policies, Visual Art Education continues to be predominantly perceived as a medium for artistic expression and aesthetic appreciation rather than as a domain that facilitates cognitive development. Existing studies have extensively examined creativity and artistic production; however, limited attention has been given to the role of Visual Art Language as a cognitive mechanism through which pupils construct meaning, interpret visual information and develop critical thinking. This study therefore explores how Visual Art Language functions as a cognitive mechanism in the development of critical thinking skills among primary school pupils. An interpretive qualitative case study design was employed involving sixty Year Five pupils from two primary schools in Lawas District, Sarawak, Malaysia. Data were collected through classroom observations, semi-structured interviews, pupils' reflective writings, visual artworks, teacher reflections and learning artefacts generated throughout the implementation of the Art Criticism Module. The data were analysed using thematic analysis supported by NVivo software. Trustworthiness was enhanced through methodological triangulation, member checking, prolonged engagement and peer review. The findings identified four interconnected cognitive processes through which Visual Art Language supported critical thinking development, namely visual observation and analytical thinking, interpretation and meaning construction, visual justification and critical evaluation, and reflective thinking with metacognitive awareness. These processes enabled pupils to organise visual experiences, justify artistic decisions, negotiate meanings and reflect upon their own reasoning. The study argues that Visual Art Language extends beyond its conventional role as a medium of artistic communication and functions as a cognitive mechanism that facilitates knowledge construction, reflective reasoning and critical thinking. The study contributes to contemporary discussions on visual thinking, meaning-making and the epistemological position of Visual Art Education by proposing Visual Art Language as an integral cognitive system within primary education.

Keywords: Visual Art Language; Cognitive Mechanism; Critical Thinking Skills; Visual Thinking; Meaning Construction; Primary Education.

INTRODUCTION

The increasing complexity of contemporary society, rapid technological advancement and the demands of knowledge-based economies have positioned critical thinking as one of the most essential competencies in twenty-first century education (Facione, 2015). Educational systems worldwide are no longer expected merely to transmit factual knowledge but to cultivate learners who are capable of analysing information, evaluating evidence, constructing reasoned judgements and solving complex problems. Consequently, contemporary educational reforms increasingly emphasise learning experiences that promote inquiry, reflection and higher-order thinking rather than rote memorisation.

Within this educational agenda, Visual Art Education occupies a distinctive yet often underestimated position. Unlike many school subjects that rely predominantly on verbal and textual communication, Visual Art Education

enables learners to engage with knowledge through images, symbols, forms, colours and spatial relationships. Such engagement requires pupils to observe, analyse, interpret and evaluate visual information before constructing meanings and communicating ideas. These cognitive activities suggest that visual experiences extend beyond artistic production and constitute meaningful processes of reasoning and knowledge construction (Eisner, 2002).

Despite this potential, Visual Art Education continues to be widely perceived as a subject primarily concerned with creativity, artistic expression and aesthetic appreciation (Freedman, 2003). Consequently, research within the field has largely focused on artistic performance, creative development and aesthetic responses, while comparatively limited attention has been devoted to understanding how Visual Art Language contributes to cognitive development, particularly in relation to critical thinking. This imbalance has resulted in a limited theoretical understanding of visual language as a mechanism through which learners organise experiences, construct meanings and develop higher-order thinking skills.

The theoretical foundations of visual cognition provide strong arguments for reconsidering the educational role of Visual Art Language. Arnheim (1969) argued that visual perception is itself a form of thinking rather than merely a passive sensory experience. According to this perspective, perception involves active cognitive processes through which individuals organise visual information, identify relationships and construct understanding. Similarly, Feldman (1994) proposed that the processes of description, analysis, interpretation and evaluation within art criticism represent systematic cognitive operations that encourage learners to reason, justify and reflect upon visual experiences. Complementing these perspectives, Ocvirk et al. (2013), through the theory of Organic Unity, emphasised that meaning emerges from the integrated relationships among visual elements rather than from isolated artistic components. Collectively, these perspectives suggest that visual engagement constitutes an important epistemological process through which knowledge is constructed. Although these theoretical perspectives have established important conceptual foundations, empirical evidence demonstrating how Visual Art Language functions as a cognitive mechanism within primary school learning remains relatively limited. Existing studies have frequently acknowledged the educational value of visual arts but have seldom examined the cognitive processes through which pupils employ visual language to observe, interpret, justify and reflect upon their thinking. Furthermore, previous research has generally positioned Visual Art Language as a communicative or expressive medium rather than as a representational system that facilitates reasoning, meaning construction and critical thinking. This theoretical and empirical gap highlights the need for further investigation into the cognitive role of Visual Art Language within classroom practice.

Addressing this gap, the present study conceptualises Visual Art Language as a cognitive mechanism that enables pupils to organise visual experiences, construct meanings and develop critical thinking through structured engagement with visual representations. Rather than viewing visual language solely as a collection of artistic elements and principles, this study argues that it functions as a symbolic cognitive system through which learners externalise thinking, negotiate meanings and engage in reflective reasoning. This conceptualisation extends existing discussions on visual thinking by positioning Visual Art Language as an integral component of cognitive development within primary education.

Accordingly, this study aims to explore how Visual Art Language functions as a cognitive mechanism in the development of critical thinking skills among primary school pupils. Using an interpretive qualitative case study approach, the study investigates how pupils employ Visual Art Language during observation, interpretation, justification and reflection throughout the implementation of the Art Criticism Module. By doing so, the study contributes to the growing body of knowledge on visual thinking, meaning-making and critical thinking while strengthening the epistemological position of Visual Art Education as a domain of cognitive development rather than merely artistic expression.

LITERATURE REVIEW

Visual Art Language as a Cognitive System for Meaning Construction

Visual Art Language refers to the organised system of visual elements, design principles and symbolic representations through which individuals communicate, interpret and construct meaning. Within Visual Art

Education, visual language traditionally comprises formal elements such as line, shape, colour, texture, form and space, together with principles including balance, contrast, harmony, emphasis, rhythm and movement. These components have conventionally been understood as the structural foundations of artistic composition and aesthetic quality (Freedman, 2003).

Contemporary perspectives, however, argue that Visual Art Language extends beyond artistic production and aesthetic appreciation. Rather than functioning solely as a formal artistic vocabulary, visual language enables learners to externalise ideas, organise experiences and construct conceptual understanding through visual representations. Images, symbols and visual relationships therefore become cognitive resources that support reasoning, communication and meaning-making. In this sense, Visual Art Language operates not merely as a medium of artistic communication but also as a representational system through which thinking becomes visible (Eisner, 2002).

Meaning construction through Visual Art Language is an active cognitive process rather than a passive reception of visual information. Learners continuously interpret visual stimuli, relate them to prior knowledge, negotiate meanings through dialogue and reconstruct understanding based on new experiences. Consequently, visual experiences become opportunities for analytical reasoning, conceptual development and reflective thinking rather than simple aesthetic responses. This perspective positions Visual Art Language as an important cognitive system within contemporary learning environments (Prameswari et al., 2023).

Visual Thinking Theory and Cognitive Development

Visual Thinking Theory provides one of the strongest theoretical foundations for understanding the relationship between perception and cognition. Arnheim (1969) challenged the traditional separation between perception and thinking by proposing that visual perception itself constitutes an active cognitive process. Rather than functioning as passive sensory input, perception enables individuals to recognise patterns, establish relationships and construct meaning through visual experiences.

From this perspective, thinking develops through interaction with visual information. Cognitive processes such as observation, comparison, classification, inference and interpretation occur simultaneously as individuals engage with images and visual representations. Visual experiences therefore contribute directly to reasoning rather than merely supporting verbal understanding.

Within educational settings, visual thinking enables learners to explore multiple interpretations, recognise alternative perspectives and establish meaningful relationships among visual elements. Pupils are encouraged to justify interpretations using visual evidence, thereby strengthening analytical reasoning and conceptual understanding. Recent educational studies similarly demonstrate that structured visual learning environments promote higher-order thinking by encouraging learners to analyse visual information systematically and construct explanations based on evidence (Buruntong & Kindoyop, 2024).

Visual Thinking Theory therefore provides an important conceptual foundation for understanding how Visual Art Language facilitates cognitive development. It supports the proposition that visual experiences should be understood as mechanisms of reasoning rather than simply as artistic activities.

Art Criticism as a Framework for Critical Thinking

Art criticism has traditionally been recognised as a pedagogical approach for understanding and appreciating artworks. Feldman (1994) proposed four interconnected stages comprising description, analysis, interpretation and evaluation. Although initially developed within art appreciation, these stages can also be understood as sequential cognitive processes that facilitate critical thinking.

Description requires learners to identify observable visual characteristics. Analysis involves recognising relationships among visual elements and compositional structures. Interpretation encourages learners to construct meanings based on visual evidence, while evaluation requires reasoned judgement supported by logical

justification (Housen, 2002). Rather than producing predetermined answers, these processes encourage learners to question, compare, justify and defend alternative interpretations.

Within classroom contexts, art criticism promotes dialogue, inquiry and reflective reasoning. Pupils become active participants in meaning construction rather than passive recipients of information. Through repeated engagement with observation, interpretation and evaluation, learners gradually develop analytical reasoning, evidence-based argumentation and reflective judgement.

Consequently, art criticism functions not merely as an instructional strategy for appreciating artworks but also as a structured pedagogical framework through which critical thinking is systematically cultivated.

Organic Unity Theory and Meaning Construction

The concept of Organic Unity proposed by Ocvirk et al. (2013) provides an additional theoretical perspective for understanding how meaning is constructed through visual experiences. The theory suggests that artworks should be understood as integrated wholes in which form, subject matter and meaning interact dynamically. Individual visual elements do not possess independent meanings; rather, meaning emerges through relationships among visual structures.

This perspective encourages learners to examine how colours, lines, shapes, textures and compositional arrangements collectively contribute to visual communication. Understanding therefore requires learners to synthesise multiple visual relationships rather than interpret isolated artistic components.

Within Visual Art Education, Organic Unity promotes holistic reasoning by encouraging pupils to examine coherence, relationships and contextual meaning. Such processes require learners to evaluate visual decisions, justify artistic choices and construct interpretations based on integrated visual evidence. Consequently, Organic Unity provides an important conceptual explanation for how Visual Art Language supports analytical reasoning and higher-order thinking.

Critical Thinking in Visual Art Education

Critical thinking is widely recognised as an essential educational outcome that enables individuals to analyse information, evaluate evidence, construct arguments and make reasoned judgements (Facione, 1990; Facione, 2015). Contemporary educational systems increasingly emphasise critical thinking as a core competency required for lifelong learning, innovation and responsible decision-making.

Within Visual Art Education, critical thinking develops through continuous engagement with observation, interpretation, evaluation, justification and reflection. Visual experiences rarely produce a single correct answer; instead, learners are encouraged to consider multiple perspectives, negotiate meanings and defend interpretations using visual evidence. Such learning environments naturally cultivate analytical reasoning, reflective judgement and metacognitive awareness (Buruntong et al., 2025).

Despite growing recognition of these educational benefits, much of the existing literature continues to position Visual Art Education primarily within the domains of creativity and artistic expression. Comparatively fewer studies have examined how Visual Art Language functions as a cognitive mechanism that facilitates reasoning, meaning construction and critical thinking. As a result, the epistemological contribution of Visual Art Education remains insufficiently theorised within contemporary educational research.

Addressing this theoretical and empirical gap, the present study conceptualises Visual Art Language as a cognitive mechanism through which pupils organise visual experiences, construct meanings and develop critical thinking. By integrating Visual Thinking Theory (Arnheim), Art Criticism (Feldman), Organic Unity (Ocvirk) and contemporary perspectives on critical thinking (Facione), this study proposes a comprehensive conceptual framework that explains how visual experiences contribute to cognitive development within primary school learning contexts.

METHODOLOGY

Research Design

This study employed an interpretive qualitative case study design to explore how Visual Art Language functions as a cognitive mechanism in the development of critical thinking skills among primary school pupils. The interpretive paradigm assumes that reality is socially constructed and that knowledge emerges through participants' experiences, interpretations and interactions within authentic educational contexts (Creswell & Poth, 2018).

A qualitative case study was considered appropriate because the phenomenon under investigation involved complex cognitive processes that could not be adequately explained through quantitative measurement alone. Rather than determining the effectiveness of an intervention through statistical comparison, the study sought to understand how pupils constructed meanings, interpreted visual experiences and developed critical thinking throughout the implementation of the Art Criticism Module.

The case study approach enabled an in-depth investigation of pupils' cognitive engagement within their natural classroom settings, allowing the researcher to capture rich descriptions of observation, interpretation, justification and reflective reasoning as they occurred during teaching and learning activities (Yin, 2018; Stake, 1995).

Research Context

The study was conducted in two government primary schools located in Lawas District, Sarawak, Malaysia. The selected schools represented both urban and rural educational contexts, providing opportunities to explore how Visual Art Language facilitated critical thinking across different learning environments.

The intervention was implemented over a period of ten weeks through the Art Criticism Module developed specifically for Year Five Visual Art Education. The module incorporated structured activities involving observation, dialogue, interpretation, artistic production and reflective writing. Throughout the intervention, pupils were encouraged to analyse visual information, justify artistic decisions, negotiate meanings and reflect upon their own thinking processes.

The classroom environment emphasised collaborative discussion and inquiry-based learning, allowing pupils to construct meanings through continuous interaction with artworks, peers and teachers.

Participants

Purposive sampling was employed to select participants who were directly involved in the implementation of the Art Criticism Module. A total of sixty Year Five pupils participated in the study, representing two primary schools in Lawas District. Thirty pupils participated in learning activities structured through the Art Criticism Module, while another thirty pupils followed regular Visual Art Education instruction to provide contextual comparison of classroom practices.

The participants represented both male and female pupils from urban and rural schools, enabling the study to capture diverse learning experiences within different educational settings.

In addition, one experienced Visual Art Education teacher participated throughout the implementation process. The teacher served as an important source of information by providing classroom observations, reflective notes and professional interpretations regarding pupils' cognitive engagement and learning development.

The selection of participants was guided by the objective of obtaining rich and meaningful information rather than achieving statistical representativeness, which is consistent with the philosophical assumptions of qualitative inquiry (Creswell & Poth, 2018).

Data Sources and Data Collection

Data were generated from multiple qualitative sources to obtain a comprehensive understanding of how Visual Art Language supported pupils' cognitive development.

The primary sources of evidence included:

- Classroom observations focusing on pupils' participation, dialogue and visual reasoning;
- Semi-structured interviews exploring pupils' interpretations, reasoning and learning experiences;
- Pupils' reflective writings documenting metacognitive awareness and meaning construction;
- Visual artworks produced throughout the intervention as representations of pupils' cognitive processes;
- Teacher reflective journals describing classroom interactions and pedagogical observations; and
- Learning artefacts generated during the implementation of the Art Criticism Module.

Data collection was conducted continuously throughout the ten-week intervention. Classroom observations were recorded during each lesson, while reflective writings and visual artefacts were collected immediately following learning activities. Semi-structured interviews were conducted upon completion of the intervention to enable participants to reflect comprehensively upon their learning experiences.

The use of multiple data sources facilitated methodological triangulation, allowing the researcher to compare evidence across different forms of qualitative data and strengthen the credibility of the findings.

Data Analysis

Data were analysed using thematic analysis following the six-phase framework proposed by Braun and Clarke (2006). NVivo software was utilised to facilitate data organisation, coding and theme development.

The analytical process consisted of six sequential stages:

1. Familiarisation with the data through repeated reading of interview transcripts, observation notes, reflective writings and visual artefacts;
2. Generation of initial codes by identifying meaningful segments related to observation, interpretation, justification, reflection and critical thinking;
3. Searching for categories by grouping conceptually related codes;
4. Development of preliminary themes describing recurring cognitive processes across participants;
5. Reviewing and refining themes through constant comparison across all data sources; and
6. Interpretation of themes by relating the findings to Visual Thinking Theory, Art Criticism, Organic Unity Theory and Critical Thinking Theory.

The final analysis identified four interconnected themes explaining how Visual Art Language functioned as a cognitive mechanism in supporting pupils' critical thinking development.

Trustworthiness

Several strategies were employed to enhance the trustworthiness of the study in accordance with the qualitative criteria proposed by Creswell and Poth (2018).

Credibility was established through prolonged engagement throughout the ten-week intervention, methodological triangulation involving six sources of qualitative evidence, and member checking during selected interview sessions to ensure that participants' intended meanings were accurately represented.

Dependability was strengthened through the maintenance of a systematic audit trail documenting data collection procedures, coding decisions and theme development throughout the research process.

Confirmability was enhanced through peer review and independent examination of the coding structure by experienced qualitative researchers. Differences in interpretation were discussed until consensus was achieved, thereby improving coding consistency and reducing researcher bias.

Transferability was supported by providing detailed descriptions of the research context, participants, classroom activities and implementation procedures, enabling readers to determine the applicability of the findings to similar educational settings.

Together, these procedures enhanced the overall rigour, credibility and trustworthiness of the qualitative findings.

Ethical Considerations

Ethical approval for the study was obtained from the relevant educational authorities prior to data collection. Permission was secured from the participating schools, while informed consent was obtained from teachers and parents or guardians of all participating pupils.

Participation was entirely voluntary, and participants were informed of their right to withdraw from the study at any stage without penalty. To ensure confidentiality, all participants were assigned pseudonyms or identification codes throughout the data analysis and reporting processes. All research data were stored securely and used exclusively for academic purposes.

RESEARCH FINDINGS

This chapter presents the findings of the study by examining how Visual Art Language functioned as a cognitive mechanism in the development of critical thinking skills among primary school pupils. Rather than merely reporting changes in pupils' learning outcomes, the analysis focuses on the cognitive processes that emerged through pupils' engagement with visual experiences during the implementation of the Art Criticism Module. In this study, the findings are interpreted as manifestations of how pupils organised visual information, constructed meanings, justified artistic decisions and reflected upon their own thinking through the use of Visual Art Language.

The analysis was conducted using thematic analysis supported by NVivo software. Data were generated from classroom observations, semi-structured interviews, pupils' reflective writings, teacher reflections and visual artefacts produced throughout the ten-week implementation of the Art Criticism Module. The integration of multiple qualitative data sources enabled the identification of recurring cognitive patterns that consistently appeared across participants and learning contexts. Rather than treating individual responses as isolated experiences, the analysis sought to explain how these experiences collectively demonstrated the operation of Visual Art Language as a system of cognition.

Four interconnected themes emerged from the analysis. The first theme explains how pupils developed analytical observation through structured visual engagement. The second theme demonstrates how pupils progressively constructed meanings through interpretation and visual dialogue. The third theme illustrates how pupils justified artistic decisions and evaluated visual evidence through reasoned arguments. The fourth theme highlights the emergence of reflective thinking and metacognitive awareness as pupils increasingly examined their own cognitive processes during artistic production. Collectively, these themes reveal that Visual Art Language functioned not merely as a medium of artistic communication but as a cognitive mechanism through which pupils organised experiences, negotiated meanings and developed critical thinking.

Theme 1: Visual Observation and Analytical Thinking

The first theme demonstrates that visual observation constituted the initial cognitive process through which Visual Art Language operated as a mechanism for critical thinking development. The findings indicate that pupils gradually shifted from merely identifying visible objects towards actively analysing relationships among colours, forms, symbols and compositional structures before making artistic decisions. This transformation suggests that observation was no longer a passive act of seeing but became an intentional process of organising visual information to construct meaning.

Classroom observations revealed that, during the early stages of the intervention, many pupils tended to produce drawings immediately after receiving instructions without critically considering the relationship between visual elements and the intended message. Their responses were generally descriptive, focusing on the appearance of objects rather than the meanings embedded within them. However, continuous engagement with the Art Criticism Module encouraged pupils to examine visual relationships more systematically before beginning their artistic work.

One pupil explained:

"Saya tak terus melukis. Saya fikir dulu apa yang saya nak tunjuk dan kenapa." (MB04)

This reflection illustrates an important cognitive shift. Rather than approaching drawing as a spontaneous artistic activity, the pupil consciously considered the intended meaning before selecting visual elements. The statement demonstrates that artistic production became preceded by cognitive deliberation, in which visual decisions were guided by reasoning rather than intuition. Such findings indicate that observation evolved into an analytical activity involving planning, interpretation and meaning construction.

This pattern was consistently reinforced through classroom observations. Throughout the implementation of the module, pupils increasingly discussed colours, symbols and compositional arrangements with their peers before producing artworks. Instead of asking what should be drawn, pupils began questioning why particular visual elements were more appropriate than others in representing specific ideas. These classroom interactions suggest that visual observation gradually developed into a form of analytical inquiry, where pupils actively examined relationships among visual components before constructing visual representations.

The findings further indicate that this transformation was strongly influenced by the structured learning experiences embedded within the Art Criticism Module. Activities involving guided observation, visual questioning and collaborative dialogue encouraged pupils to slow down their artistic processes and engage in deliberate examination of visual evidence. Consequently, pupils became increasingly aware that every visual element carried potential meaning and required thoughtful consideration before being incorporated into their artworks.

This finding is consistent with the conceptualisation of Visual Art Language proposed in this study, whereby visual elements function not merely as artistic components but as cognitive resources that enable learners to organise experiences and construct meanings. The progression from spontaneous observation towards analytical observation demonstrates that pupils were no longer simply looking at visual objects; rather, they were actively thinking through visual representations.

Overall, Theme One demonstrates that analytical observation represents the foundational cognitive operation through which Visual Art Language begins to function as a mechanism for critical thinking. The findings suggest that pupils' ability to observe systematically enabled subsequent processes of interpretation, justification and reflection, thereby positioning visual observation as the first stage in the development of higher-order thinking through Visual Art Education.

Theme 2: Interpretation and Meaning Construction

The second theme demonstrates that Visual Art Language functioned as a cognitive mechanism through pupils'

progressive development of interpretation and meaning construction. The findings revealed that pupils gradually moved beyond describing visible objects towards constructing meanings based on relationships among visual elements, personal experiences and contextual understanding. Rather than perceiving artworks as static representations, pupils increasingly interpreted images as symbolic systems capable of communicating ideas, emotions and social meanings.

At the beginning of the intervention, classroom observations indicated that many pupils tended to describe artworks literally by identifying objects, colours and shapes without explaining their significance. Their responses reflected descriptive observation rather than interpretative reasoning. However, continuous participation in structured visual discussions encouraged pupils to justify their interpretations using visual evidence and personal experiences. As learning progressed, pupils increasingly recognised that meaning was not inherent within an image itself but emerged through active engagement with visual representations.

One participant explained:

"Aku dulu tanya kawan saya pilih warna gitu, saya dengar dan baru masuk akal alasan dia." (MB09)

This statement illustrates an important shift from individual interpretation towards collaborative meaning construction. Rather than accepting visual representations at face value, the pupil began to appreciate that alternative interpretations could emerge through dialogue with others. Listening to peers' explanations enabled the pupil to reconsider personal assumptions and reconstruct meanings based on shared reasoning. This finding suggests that interpretation developed through interaction rather than individual perception alone.

Classroom observations consistently supported this pattern. During group discussions, pupils increasingly questioned one another regarding the meanings of colours, symbols and compositional choices. Instead of asking whether a drawing was aesthetically attractive, pupils explored why particular visual decisions had been made and how these decisions contributed to the intended message. Such discussions transformed classroom interactions from evaluative conversations into collaborative inquiries centred on meaning-making.

Teacher reflections further reinforced this development. Throughout the implementation of the Art Criticism Module, pupils demonstrated increasing confidence in explaining the symbolic meanings embedded within their artworks. Rather than providing isolated personal opinions, they progressively referred to visual evidence when defending interpretations. This progression indicates that pupils were no longer relying solely on intuition but were constructing interpretations through analytical engagement with visual language.

The findings further reveal that interpretation became closely associated with pupils' lived experiences. Many participants connected colours, symbols and visual narratives with memories, emotions and everyday situations encountered within their own social environments. Consequently, visual interpretation became a process of integrating prior knowledge, personal experience and visual evidence into coherent explanations. Meaning was therefore actively constructed through cognitive engagement rather than passively received from visual images.

Importantly, the findings indicate that Visual Art Language functioned as a representational system through which pupils externalised their thinking. Visual elements became symbolic resources that enabled learners to organise abstract ideas into observable representations. Through this process, interpretation extended beyond understanding artworks to include the construction of personal meaning, negotiation of perspectives and development of conceptual understanding. The findings therefore suggest that meaning-making represented a dynamic cognitive process mediated by visual language.

Overall, Theme Two demonstrates that interpretation should not be understood merely as explaining the content of an artwork. Instead, it represents a cognitive process through which pupils negotiated meanings, integrated experiences and constructed understanding through Visual Art Language. This finding strengthens the central argument of the present study that Visual Art Language functions as a cognitive mechanism by enabling learners to transform visual experiences into meaningful knowledge rather than simply producing artistic expressions.

Theme 3: Visual Justification and Critical Evaluation

The third theme demonstrates that Visual Art Language functioned as a cognitive mechanism by enabling pupils to justify visual decisions and critically evaluate both their own artworks and those produced by their peers. The findings revealed that pupils progressively moved beyond intuitive artistic choices towards evidence-based reasoning, where colours, symbols, compositional arrangements and visual elements were deliberately selected and defended according to their intended meanings. This transition represents an important manifestation of critical thinking, as pupils increasingly employed logical justification rather than subjective preference when explaining artistic decisions.

At the beginning of the intervention, classroom observations indicated that pupils frequently selected colours, shapes and compositional arrangements based primarily on personal preference. Their explanations were generally brief and descriptive, often limited to statements such as "I like this colour" or "It looks beautiful." Such responses reflected aesthetic preference rather than analytical judgement. However, following sustained engagement with the Art Criticism Module, pupils increasingly supported their artistic choices by referring to symbolic meanings, contextual relevance and visual relationships.

Teacher reflections provided further evidence of this cognitive transformation. One teacher observed:

"Saya perasan saya kurang beri arahan terus, lebih banyak tanya soalan supaya murid sendiri fikir." (G01)

This statement illustrates a significant pedagogical shift from direct instruction towards guided inquiry. Rather than providing predetermined answers, the teacher intentionally employed questioning strategies that encouraged pupils to examine their own reasoning before making artistic decisions. Such questioning functioned as cognitive scaffolding, enabling pupils to articulate, defend and refine their interpretations through reflective dialogue. Consequently, visual justification emerged not as a spontaneous ability but as a cognitive process facilitated through purposeful pedagogical interaction.

Nevertheless, the findings also indicate that the development of critical evaluation did not occur uniformly across all participants. Some pupils required continuous guidance before they were able to articulate visual interpretations confidently. As reflected by the teacher:

"Ada murid yang diam saja. Kalau tidak dibimbing dengan soalan, mereka susah nak bercakap." (G03)

This observation demonstrates that critical thinking through Visual Art Language is not automatically activated simply by engaging in artistic activities. Rather, it develops through sustained interaction between structured learning experiences and pedagogical support. The findings therefore suggest that teacher questioning played a mediating role in enabling pupils to transform visual observation into analytical reasoning and evidence-based judgement.

Classroom observations further revealed that pupils gradually became more confident in evaluating both their own artworks and those of their peers. During visual discussions, pupils increasingly referred to specific artistic elements when explaining strengths, weaknesses and alternative interpretations. Rather than expressing simple approval or disapproval, they began to justify evaluations by explaining how colours, composition, symbolism and visual balance contributed to the intended message of an artwork. Such responses indicate that critical evaluation became grounded in visual evidence rather than personal opinion.

Importantly, the findings suggest that visual justification represented more than an ability to explain artistic choices. Instead, it reflected pupils' capacity to organise visual experiences into coherent arguments supported by logical reasoning. Through repeated participation in dialogue, questioning and reflective evaluation, pupils developed greater awareness of the relationships between visual decisions and conceptual meanings. This progression demonstrates that Visual Art Language functioned as a representational system through which reasoning became observable and communicable.

Furthermore, the findings indicate that critical evaluation contributed to pupils' broader cognitive development by encouraging them to compare alternative interpretations, reconsider initial assumptions and revise artistic decisions based on constructive feedback. Such iterative processes illustrate that justification and evaluation were not isolated learning outcomes but interconnected cognitive operations that strengthened analytical reasoning and supported the construction of deeper understanding.

Overall, Theme Three demonstrates that Visual Art Language facilitated critical thinking by enabling pupils to justify artistic decisions, evaluate visual evidence and construct reasoned arguments. Rather than relying upon intuition or aesthetic preference alone, pupils increasingly engaged in deliberate cognitive processes through which visual experiences were analysed, defended and refined. These findings reinforce the central proposition of the present study that Visual Art Language functions as a cognitive mechanism by transforming artistic decision-making into a process of analytical reasoning, critical evaluation and knowledge construction.

Theme 4: Reflective Thinking and Metacognitive Awareness

The fourth theme demonstrates that Visual Art Language facilitated the development of reflective thinking and metacognitive awareness by encouraging pupils to examine not only the outcomes of their artistic activities but also the cognitive processes underlying their visual decisions. The findings revealed that pupils progressively became aware of how meanings were constructed through colours, symbols, forms and compositional arrangements. Rather than focusing solely on producing aesthetically pleasing artworks, pupils increasingly reflected upon why particular visual choices were made and how these choices communicated intended meanings.

At the early stages of the intervention, reflective responses were generally limited to simple descriptions of completed artworks. Pupils frequently commented on whether they liked or disliked their work without explaining the reasoning behind their artistic decisions. However, as the implementation of the Art Criticism Module progressed, reflective writing demonstrated a substantial shift towards deeper cognitive awareness. Pupils increasingly articulated the relationships between visual elements, intended meanings and personal reasoning, indicating the emergence of metacognitive reflection.

One pupil expressed this development by stating:

"Sebelum ini saya melukis saja. Lepas sekarang saya fikir dulu kenapa saya pilih warna dan apa maksud lukisan saya." (MB07)

This reflection illustrates a significant transformation in the pupil's cognitive orientation towards artistic practice. Initially, drawing was perceived primarily as an activity of image production. Following sustained engagement with structured visual learning experiences, however, artistic production became preceded by conscious consideration of meaning, intention and symbolic representation. The pupil demonstrated an awareness that visual decisions were neither arbitrary nor purely aesthetic, but purposeful cognitive actions through which ideas could be communicated and interpreted. Such findings indicate the emergence of metacognitive awareness, whereby pupils consciously monitored and evaluated their own thinking throughout the artistic process.

The findings further revealed that reflective thinking extended beyond cognitive reasoning to include emotional understanding. Pupils increasingly recognised that visual representations could communicate emotions and influence viewers' interpretations. One participant reflected:

"Saya sedih sebab saya mahu rasa orang lain dalam lukisan itu pun rasa perkara yang saya rasa." (MB15)

This statement demonstrates that reflection involved the integration of cognitive and affective dimensions. Rather than merely expressing personal emotions, the pupil intentionally considered how visual representations might evoke similar emotional responses in others. Reflection therefore became a process of anticipating audience interpretation, evaluating communicative effectiveness and refining artistic intentions. Such awareness illustrates that Visual Art Language enabled pupils to construct meanings that were simultaneously personal, social and reflective.

Teacher observations further supported this interpretation. Throughout the implementation of the module, pupils increasingly revisited their own artworks, reconsidered earlier decisions and modified visual elements after receiving feedback from peers and teachers. Rather than perceiving revision as correcting mistakes, pupils viewed it as an opportunity to improve the clarity of meaning communicated through visual representations. This iterative process demonstrates that reflection functioned as an ongoing cognitive activity rather than a concluding classroom exercise.

The findings also indicate that reflective thinking strengthened pupils' ability to regulate their own learning. Through repeated engagement in reflective writing, dialogue and self-evaluation, pupils became increasingly capable of identifying strengths and weaknesses within their own visual reasoning. Consequently, they demonstrated greater independence in evaluating artistic decisions and refining interpretations without relying exclusively upon teacher guidance. Reflection therefore functioned as a mechanism through which learners gradually assumed responsibility for monitoring, evaluating and improving their own cognitive processes.

Importantly, the analysis suggests that metacognitive awareness emerged through the integration of observation, interpretation and justification developed in the preceding themes. Reflection did not occur independently but represented the culmination of a sequence of interconnected cognitive operations. Pupils first observed visual information, interpreted meanings, justified artistic decisions and subsequently reflected upon the effectiveness of those decisions in communicating intended ideas. This progression demonstrates that reflection constituted the highest level of cognitive engagement within the operation of Visual Art Language.

Overall, Theme Four demonstrates that reflective thinking and metacognitive awareness completed the cognitive cycle through which Visual Art Language supported critical thinking development. Reflection enabled pupils not only to evaluate their artworks but also to become increasingly conscious of how they observed, interpreted, justified and constructed meanings through visual experiences. These findings reinforce the central argument of the present study that Visual Art Language functions as a cognitive mechanism by supporting self-regulated learning, reflective reasoning and the continuous refinement of critical thinking processes.

Cross-Theme Synthesis

Taken together, the four themes reveal that Visual Art Language operated as an integrated cognitive mechanism rather than a collection of isolated artistic skills. Analytical observation enabled pupils to identify and organise visual information systematically. Interpretation transformed visual experiences into meaningful understanding through dialogue and personal reflection. Visual justification encouraged pupils to defend artistic decisions using evidence-based reasoning, while reflective thinking promoted metacognitive awareness by enabling learners to evaluate and regulate their own cognitive processes. These four themes formed a continuous cognitive sequence in which each process supported the development of the next.

The findings therefore suggest that critical thinking within Visual Art Education is not an incidental outcome of artistic production but emerges through structured engagement with Visual Art Language. Throughout the implementation of the Art Criticism Module, pupils progressively demonstrated the ability to organise experiences, negotiate meanings, justify interpretations and reflect upon their own reasoning. Consequently, Visual Art Language should be understood as a symbolic cognitive system through which learners construct knowledge, externalise thinking and develop higher-order reasoning.

The integrated relationship among the four themes is summarised in Figure 1.

Visual Art Language
↓
Analytical Observation
↓
Interpretation and Meaning Construction
↓
Visual Justification and Critical Evaluation

↓
Reflective Thinking and Metacognitive Awareness
↓
Knowledge Construction
↓
Critical Thinking Skills

Figure 1. Visual Art Language as a Cognitive Mechanism in the Development of Critical Thinking Skills

SUMMARY OF FINDINGS

The findings consistently demonstrate that Visual Art Language extends beyond its conventional role as a medium for artistic expression. Instead, it functions as a cognitive mechanism through which pupils actively organise visual experiences, construct meanings, justify decisions and regulate their own thinking. The four interconnected themes provide empirical evidence that critical thinking develops through a progressive sequence of cognitive operations activated during structured visual learning experiences. Accordingly, the study proposes that Visual Art Language should be recognised as an essential representational system that supports reasoning, meaning-making and higher-order thinking within primary school Visual Art Education.

Operationalisation of Critical Thinking

To ensure conceptual clarity, critical thinking in this study was operationalised as a series of observable cognitive processes manifested through pupils' engagement with Visual Art Language during the implementation of the Art Criticism Module. Rather than conceptualising critical thinking as a general cognitive ability or measuring it through standardised psychometric instruments, the present study interpreted critical thinking as an emergent process evidenced through pupils' visual reasoning, classroom interactions, reflective writings, artistic productions and verbal explanations.

The operationalisation of critical thinking was informed by Facione's (1990; 2015) conceptualisation of critical thinking and interpreted within the context of Visual Art Education. Accordingly, five interrelated cognitive dimensions guided the thematic analysis: observation, interpretation, visual justification, critical evaluation, and reflective reasoning. These dimensions were not treated as discrete competencies but as interconnected cognitive operations that collectively explained how pupils organised visual experiences and constructed meaning through Visual Art Language.

Observation referred to pupils' ability to identify, examine and organise visual information by recognising relationships among colours, forms, symbols and compositional elements. Interpretation described pupils' capacity to construct meanings from visual representations by integrating prior knowledge, contextual understanding and personal experiences. Visual justification referred to pupils' ability to explain and defend artistic decisions through logical reasoning supported by visual evidence. Critical evaluation involved pupils' ability to assess the appropriateness of visual choices, compare alternative interpretations and make reasoned judgements regarding artworks. Reflective reasoning represented pupils' awareness of their own thinking processes, demonstrated through self-evaluation, refinement of artistic decisions and metacognitive reflection.

These operational dimensions guided the coding and thematic analysis conducted using NVivo software. Rather than seeking isolated instances of critical thinking, the analysis focused on identifying recurring patterns of cognitive engagement that consistently emerged across classroom observations, pupils' reflective writings, semi-structured interviews, teacher reflections and visual artefacts. The convergence of evidence across these multiple qualitative sources strengthened the interpretation that the identified themes represented meaningful manifestations of critical thinking within authentic classroom practice.

Based on this analytical framework, four overarching themes were generated through thematic analysis, namely Visual Observation and Analytical Thinking, Interpretation and Meaning Construction, Visual Justification and Critical Evaluation, and Reflective Thinking and Metacognitive Awareness. Collectively, these themes provide

empirical evidence explaining how Visual Art Language functioned as a cognitive mechanism through which pupils progressively developed critical thinking throughout the learning process.

Table 1. Summary of Themes Emerging from the Thematic Analysis

Theme	Operational Dimension of Critical Thinking	Empirical Evidence	Cognitive Interpretation
Theme 1: Visual Observation and Analytical Thinking	Observation and Analysis	Classroom observations, pupils' reflective writings, visual artefacts	Pupils progressively organised visual information by identifying relationships among colours, forms, symbols and compositional structures before making artistic decisions. Observation evolved from passive perception into analytical reasoning.
Theme 2: Interpretation and Meaning Construction	Interpretation	Semi-structured interviews, reflective writings, classroom dialogue	Pupils constructed meanings by integrating visual evidence with prior knowledge and personal experiences. Meaning-making emerged through dialogue, interpretation and negotiation of perspectives.
Theme 3: Visual Justification and Critical Evaluation	Justification and Evaluation	Teacher reflections, classroom discussions, pupils' explanations	Pupils increasingly defended artistic decisions using logical reasoning supported by visual evidence. Evaluation shifted from subjective opinion towards evidence-based judgement.
Theme 4: Reflective Thinking and Metacognitive Awareness	Reflective Reasoning	Reflective journals, interviews, visual artefacts	Pupils became increasingly aware of their own thinking processes, evaluating and refining artistic decisions through self-reflection and metacognitive regulation.

Cross-Theme Synthesis

The thematic analysis demonstrates that the four themes identified in this study should not be interpreted as isolated dimensions of learning but as interconnected cognitive processes that collectively explain how Visual Art Language functioned as a cognitive mechanism in the development of pupils' critical thinking skills. Rather than occurring independently, analytical observation, interpretation, visual justification and reflective thinking formed a progressive cognitive sequence through which pupils organised visual experiences, constructed meanings and regulated their own reasoning throughout the implementation of the Art Criticism Module.

The findings indicate that analytical observation represented the initial cognitive operation. Through systematic engagement with visual elements, pupils gradually learned to identify relationships among colours, forms, symbols and compositional structures before making artistic decisions. Observation therefore extended beyond simple visual recognition and became an analytical activity through which visual information was organised and prepared for further cognitive processing.

The second cognitive process emerged through interpretation and meaning construction. Having organised visual information, pupils actively constructed meanings by integrating prior knowledge, personal experiences and contextual understanding with visual evidence. Classroom dialogue further facilitated this process by exposing pupils to multiple perspectives, enabling them to negotiate meanings and refine interpretations through collaborative inquiry. Consequently, interpretation functioned as the bridge between visual perception and conceptual understanding.

The third process involved visual justification and critical evaluation. As pupils became increasingly capable of interpreting visual representations, they also demonstrated greater ability to defend artistic decisions using logical reasoning supported by visual evidence. Rather than relying upon aesthetic preference or intuition, pupils progressively evaluated artworks through analytical judgement, compared alternative interpretations and justified visual decisions using coherent arguments. This progression illustrates the emergence of evidence-based reasoning as a central characteristic of critical thinking within Visual Art Education.

The final cognitive process was reflected through metacognitive awareness and reflective thinking. Reflection enabled pupils to examine not only the outcomes of their artistic work but also the reasoning processes underlying their visual decisions. Through reflective writing, classroom dialogue and self-evaluation, pupils became increasingly aware of how meanings were constructed, revised and communicated through Visual Art Language. Reflection therefore represented the culmination of the cognitive sequence by enabling learners to regulate and continuously improve their own thinking.

Collectively, these findings suggest that Visual Art Language should not be understood merely as a collection of artistic elements or principles of design. Instead, it functions as an integrated cognitive system through which pupils progressively organise perception, construct meaning, justify reasoning and regulate thinking. The interaction among the four themes demonstrates that critical thinking did not emerge from artistic production alone but developed through structured engagement with visual experiences facilitated by the Art Criticism Module.

Based on these findings, the present study proposes a conceptual understanding of Visual Art Language as a cognitive mechanism operating through four interconnected stages: (i) analytical observation, (ii) interpretation and meaning construction, (iii) visual justification and critical evaluation, and (iv) reflective thinking and metacognitive awareness. These interconnected processes provide empirical evidence supporting the proposition that Visual Art Language facilitates knowledge construction by transforming visual experiences into systematic cognitive activities that promote critical thinking among primary school pupils.

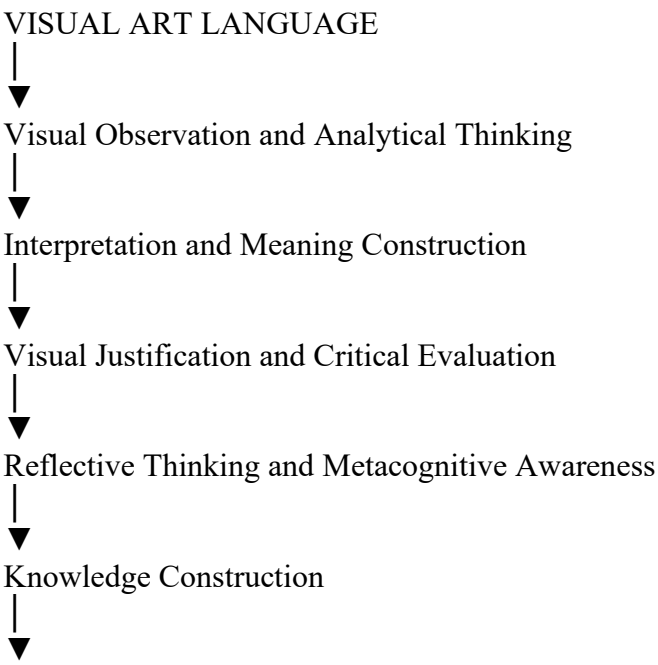

Figure 1. Conceptual Model of Visual Art Language as a Cognitive Mechanism in the Development of Critical Thinking Skills

The findings of this study consistently demonstrate that Visual Art Language extends beyond its conventional role as a medium of artistic communication and aesthetic expression. Across the four interconnected themes, pupils progressively organised visual information, constructed meanings, justified artistic decisions and reflected

upon their own cognitive processes. These findings provide empirical evidence that critical thinking developed through a sequence of interconnected cognitive operations facilitated by structured engagement with Visual Art Language during the implementation of the Art Criticism Module.

The study therefore concludes that Visual Art Language functioned as a cognitive mechanism through which pupils transformed visual experiences into meaningful knowledge. Rather than viewing observation, interpretation, justification and reflection as separate learning activities, the findings suggest that these processes collectively formed an integrated system of reasoning that supported knowledge construction and critical thinking. The implications of these findings are discussed in the following section, where the empirical evidence is interpreted in relation to contemporary theories of visual thinking, art criticism and critical thinking.

CONCLUSION

This study demonstrates that Visual Art Language functions as a cognitive mechanism in the development of critical thinking among primary school pupils. Through structured engagement in observation, interpretation, visual justification and reflective thinking, pupils progressively transformed visual experiences into meaningful knowledge and reasoned judgement. These findings indicate that critical thinking in Visual Art Education develops through systematic meaning construction rather than artistic production alone.

The study contributes to the field by reconceptualising Visual Art Language as an integrated cognitive system that supports visual reasoning, knowledge construction and reflective thinking. This perspective strengthens the educational significance of Visual Art Education and provides empirical support for the use of the Art Criticism Module as a pedagogical framework for developing higher-order thinking skills.

Although the findings are limited to the context of two primary schools in Lawas, they offer valuable insights into the cognitive role of Visual Art Language in classroom practice. Future studies may examine the proposed conceptual framework across different educational settings and employ mixed-methods approaches to further validate the relationship between Visual Art Language and critical thinking development.

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