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Visual Characteristics of Coloring-Pattern Works among Primary School Students Aged 7–10 Years in Wenang District, Indonesia: Implications for Applied Art Education

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ABSTRACT

Purpose: This study describes and interprets the visual characteristics of coloring works produced by primary school students aged 7–10 years in Wenang District, Manado City, Indonesia, and examines their implications for applied art education. **Methods:** A descriptive qualitative design was used. The primary data comprised 369 coloring works produced during a 2025 competition, supported by observation, open interviews, documentation, literature study, source triangulation, and interactive qualitative analysis. **Findings:** Students aged 7–8 years showed emerging hand control, directed lines, color-object awareness, initial spatial organization, and smooth visual texture, whereas students aged 9–10 years demonstrated greater detail, differentiated and occasionally symbolic color use, improved color placement, and clearer foreground-middle ground-background organization. **Research Implications:** Structured coloring tasks can function as formative assessment and as age-responsive applied learning for visuomotor practice, visual literacy, scaffolding, and differentiated creative instruction. **Originality:** The study integrates line, color, texture, form, and spatial organization in pre-drawn coloring works and translates these visual indicators into practical implications for primary applied art education in an Indonesian local context.

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INTRODUCTION

Drawing and coloring are among the most accessible visual-art activities in childhood. They provide opportunities for children to coordinate visual perception and hand movement, make representational decisions, and communicate ideas through line, color, shape, texture, and spatial arrangement. Research has described drawing as both a developmental achievement and a cognitive-cultural tool through which children think, communicate, remember, and solve problems (Jolley, 2010; Rose et al., 2012; Milbrath et al., 2015). More recent evidence also suggests that drawing skill is shaped not only by maturation but by social learning, adult guidance, and scaffolding (Mendoza Straffon et al., 2024).

Coloring pre-drawn patterns differs from free drawing because the basic contours are already provided. The child therefore concentrates more directly on tool control, color selection, boundary management, blending, surface treatment, and visual organization. Such activities can support fine-motor practice and creative decision-making when they are implemented as meaningful learning rather than repetitive filling tasks. Arts-based and drawing-coloring activities have been associated with fine-motor development, creative thinking, symbolic understanding, and cognitive engagement (Hardiman et al., 2019; Afnida et al., 2023; Pratiwi et al., 2023).

Children's use of color should be interpreted cautiously. Color may reflect object knowledge, representational conventions, aesthetic preference, task context, and, in some situations, emotional meaning. It should not be treated as a stand-alone psychological diagnostic indicator (Burkitt & Newell, 2005; Burkitt et al., 2014; Vivaldi & Salsa, 2021). For educational purposes, a more defensible approach is to examine how children select, differentiate, combine, and place colors in relation to objects and visual composition.

In Manado City, coloring competitions for public and private primary school students are regularly organized in connection with educational and national commemorations. The present study focuses on a coloring-pattern competition involving Phase A students from School Clusters 1, 2, and 3 in Wenang District. The 2025 event provided a substantial corpus of children's works that can be examined not merely as competition products but as evidence of visual learning.

Previous research has established that children's drawing and coloring activities function as important domains for understanding representation, creativity, communication, meaning-making, and visuomotor development (Deaver, 2009; Brechet et al., 2020; Goodman et al., 2022; Areljung et al., 2022). Existing studies have demonstrated that children's visual production is influenced by maturation, social interaction, cultural experience, instructional support, and opportunities for practice. However, most research has focused on free drawing, symbolic representation, or general creativity development rather than examining how specific visual

elements within pre-drawn coloring works develop together. It remains unclear how line control, color placement, texture, form representation, and spatial organization appear simultaneously in coloring-pattern works produced by early primary-school students, particularly within the Indonesian educational context. Therefore, this study advances previous research by moving beyond the description of children's drawings as general creative products and by proposing an integrated visual analysis framework that examines observable artistic indicators across different age groups. Such an approach provides practical knowledge for teachers in designing age-responsive applied art education.

The study uses developmental perspectives associated with Kerchensteiner, Cyril Burt, and Victor Lowenfeld as interpretive references for understanding changes in children's visual expression. These perspectives suggest that children's artworks develop from early forms of spontaneous graphic expression toward more organized representation, increasing attention to detail, and more complex spatial relationships. However, the present study does not apply these stages as fixed developmental categories. Instead, they are used as analytical references for interpreting patterns observed in students' coloring works, while recognizing that artistic development is also shaped by experience, culture, media, instruction, and learning environments (Deaver, 2009; Goodman et al., 2022).

Accordingly, this study asks: What are the visual characteristics of coloring-pattern works produced by Phase A primary school students in Wenang District, Manado City? The study aims to describe and interpret the students' coloring techniques and the characteristics of line, color, texture, form, and spatial organization across the 7–8 and 9–10 year age groups, and to formulate implications for educational development and applied art education.

METHOD

This study employed a descriptive qualitative approach. The research was conducted in the context of a 2025 coloring-pattern competition held on the fifth floor of the IT Center Building in Manado City. Participants were Phase A primary school students from Grades 1 and 2, representing the 7–10 year age range, from public and private primary schools in Wenang District.

The main documentary data consisted of 369 student coloring works and photographs of the competition. Supporting data were obtained from students, teachers or art instructors, school principals, event organizers, and relevant written sources concerning children's creativity, visual development, fine-motor development, visual elements, and artistic learning.

Data were collected through observation, open interviews, documentation, and literature study. Observation focused on the competition process and students' completed works. Open interviews addressed coloring techniques, colors that attracted children's interest, students' responses to the prepared patterns, and the conditions of the competition environment. Documentation included photographs and the collected works, while literature study provided conceptual support for interpreting visual characteristics.

Source triangulation was used to strengthen credibility. Information from different informants was compared to identify convergent and divergent accounts. These comparisons were then interpreted together with documentary and observational evidence rather than relying on a single source.

Data analysis followed the interactive model of Miles and Huberman as referenced through Sutopo (2006), consisting of data reduction, data display, conclusion drawing, and verification. Relevant information from field notes, interviews, documentation, and the 369 works was selected and organized according to technique, line, color, texture, form, and space. Interpretive conclusions were repeatedly checked against the available data.

Recent approaches to qualitative visual analysis clarify why the artwork itself should be treated as a situated visual document rather than as a transparent measure of a child's inner state. Payne (2023) demonstrates the value of systematic interpretation of children's visual artefacts within their social and instructional context, while Hou et al. (2026) show how large collections of children's drawings can be organized through clearly defined visual units and iterative coding. In the present study, the pre-drawn template limits what can be inferred about independent composition; accordingly, visual observations were interpreted primarily in terms of coloring decisions and visible treatment of supplied contours, rather than as direct measures of psychological traits or developmental diagnoses.

The credibility of the interpretations rests on comparing the artwork, field observations, and available interview accounts, as described above. Contemporary methodological literature emphasizes that triangulation should examine disagreement as well as convergence, and that transferability depends on sufficiently detailed contextual reporting (Ahmed, 2024; Patterson et al., 2023). Reflexivity is also important because researchers' assumptions about age-appropriate coloring, realism, or aesthetic quality may shape how images are categorized (Olmos-Vega et al., 2023). These principles provide criteria for critically assessing the present analysis; the available source manuscript does not document a reflexive diary, a formal audit trail, independent coders, or a statistical inter-coder agreement exercise, so these procedures are not claimed as completed.

For transparent replication and future reanalysis, the analytic categories technique, line, color, texture, form, and space should be accompanied by operational definitions, illustrative examples, decision rules for ambiguous cases, and category totals by age group. Cole (2024) and Halpin (2024) discuss how coding reconciliation and, when compatible with the analytic approach, inter-coder agreement can improve reporting clarity. Such checks

require access to the original coding records and cannot be inferred from the 369-work corpus alone. The present manuscript therefore retains its descriptive qualitative orientation, without adding unverified reliability coefficients or category frequencies.

RESULTS

The competition was held on 24–25 November 2025 at the IT Center Building in Manado and involved 33 public and private primary schools in Wenang District, with a total of 369 Phase A participants. Students colored a pattern prepared by the organizers. The observed approaches were classified according to the visual-analysis framework consisting of technique, line, color, texture, form, and space. The dominant technique identified across the corpus was dusel or rubbing/blending, which was recognized through visible characteristics such as layered pigment, gradual transitions, and relatively even surface coverage. Materials identified in the works included oil pastels, crayons, and colored pencils. To strengthen empirical transparency, the distribution of each coded category should be presented using descriptive frequencies and proportions based on the final coding results.

Among students aged 7–8 years, coded observations indicated developing hand control reflected through contour following, reduced irregular marks, and increasing consistency in line direction. These are direct visual observations from the artworks. The interpretation that these characteristics represent developing coordination between visual observation and motor control is discussed as a developmental interpretation supported by visuomotor literature.

Among students aged 9–10 years, coded observations showed more stable contour control and increased use of lines for internal details, including clothing, drapery, and object differentiation. These findings represent observable visual characteristics. Their relationship with more advanced representational development is interpreted cautiously in relation to developmental-art perspectives.

Across the coded works, color analysis focused on color-object relationships, placement consistency, differentiation, and symbolic or non-naturalistic choices. The proportion of works demonstrating each category should be reported based on the coding results. Students aged 7–8 years demonstrated an emerging ability to associate colors with represented objects. Among students aged 9–10 years, color placement was more differentiated and, in some works, symbolic. The source data include examples in which human faces were colored green or red, indicating that children did not always use color naturalistically.

The older group also demonstrated more specific color differentiation according to object context. The source material, for example, notes distinctions between blue used for the sea and blue used for a lake. This suggests that color decisions increasingly incorporated observation, object knowledge, and aesthetic choice.

Smooth visual texture was the dominant characteristic in both age groups. This appearance was associated with the use of oil pastels, crayons, colored pencils, and rubbing or blending processes. In two-dimensional coloring, texture emerged from the density, direction, layering, and smoothing of marks on the paper surface.

Works by students aged 7–8 years were characterized by improving hand control, more directed lines, the ability to compare the colored image with the represented object, emerging concepts of people and the environment, initial awareness of picture-space organization, awareness of three-dimensional cues, recognition of color-object relationships, increasingly logical treatment of object forms, and predominantly smooth texture.

Works by students aged 9–10 years showed characteristics associated with an emerging realism orientation: clearer differentiation of human figures through clothing or gender-related visual cues, greater attention to object detail, occasional symbolic color use, improved placement of colors in relation to objects, predominantly smooth texture, and an ability to distinguish foreground, middle ground, and background.

Table 1. Visual Characteristics by Age Group

Visual Aspect	Age 7–8 Years	Age 9–10 Years
Hand and line control	Emerging control; lines are less scribble-like.	More stable and detail-oriented line use.
Form	Begins to compare the image with represented objects.	More detailed and visually differentiated representation.
Color	Emerging awareness of color-object relationships.	More specific placement; occasional symbolic color use.
Space	Initial awareness of picture field and spatial relations.	Distinguishes foreground, middle ground, and background.
Texture	Predominantly smooth.	Predominantly smooth.
Developmental interpretation	Pre-schematic/schematic and descriptive-realism tendencies.	Visual and emerging-realism tendencies.

DISCUSSION

The findings show that coloring works can provide observable evidence of children's developing visual control. The predominance of rubbing/blending techniques suggests that students were not merely filling spaces but were

attempting to manage color density and surface continuity. Because drawing and coloring require coordinated tool use, the development of line and surface control can be interpreted in relation to visuomotor integration and manual skill (Shukri & Howes, 2019; Snapp-Childs et al., 2019).

The improvement in line control between the two age groups is consistent with the idea that children's graphic production becomes increasingly organized with age and experience. However, age should not be treated as the only determinant. Adult scaffolding, opportunities to observe skilled models, and guided practice can also contribute to drawing development. Mendoza Straffon et al. (2024), for example, found that scaffolding was positively associated with children's drawing skill and specifically highlighted implications for art education at home and school.

The color findings also have educational significance. Students' growing ability to relate colors to objects and to differentiate color placement indicates that coloring tasks can reveal developing visual discrimination and representational knowledge. At the same time, symbolic or unconventional color use should not automatically be corrected because it may reflect experimentation or expressive choice. Studies of children's color use emphasize the importance of context when interpreting color in drawings (Burkitt & Newell, 2005; Burkitt et al., 2014; Vivaldi & Salsa, 2021).

The predominance of smooth visual texture can be understood as an interaction between material, technique, and motor control. Different tools provide different sensory and graphic affordances, and digital or physical drawing media can shape the production process (Bitu et al., 2022; Ho et al., 2017). In applied art education, teachers can therefore vary materials intentionally to develop pressure control, blending, layering, boundary control, and textural experimentation.

The increased differentiation of foreground, middle ground, and background among students aged 9–10 years indicates developing spatial organization. This is pedagogically important because spatial arrangement is relevant not only to art but also to visual literacy, diagram comprehension, design thinking, and communication. Arts-integrated learning has been shown to support engagement with academic content and memory when visual production is meaningfully connected to learning goals (Hardiman et al., 2019).

These results support a shift from viewing coloring as a supplementary or recreational classroom activity toward viewing it as a structured applied-learning task. Recent studies similarly report that drawing- and coloring-based activities can stimulate creative thinking, fine-motor development, and cognitive engagement when accompanied by exploration and scaffolding (Afnida et al., 2023; Pratiwi et al., 2023).

First, the findings can inform age-responsive curriculum design in primary art education. Teachers can translate observable visual characteristics into progressive learning objectives. For ages 7–8, instruction may emphasize grip and pressure control, staying within or intentionally crossing boundaries, recognizing color-object relationships, and organizing simple picture fields. For ages 9–10, learning can progress toward color gradation, detail, layering, spatial depth, foreground-background relationships, and more independent aesthetic decision-making.

Second, coloring works can be used as low-cost formative assessment artifacts. Rather than assigning a single aesthetic score, teachers can use analytic rubrics covering line control, color choice, color consistency, texture, spatial organization, detail, and creative variation. Repeated work samples can then document individual progress over time. This approach makes visual-art assessment more educationally useful and reduces overreliance on competition rankings.

Third, the study supports an applied scaffolding model for classroom practice. Teachers can demonstrate a technique, provide verbal prompts, allow guided practice, and gradually reduce assistance as students gain control. This implication is supported by recent evidence that adult scaffolding is positively related to children's drawing skill and that guidance and opportunities to imitate skilled models are relevant to art learning (Mendoza Straffon et al., 2024).

Fourth, the findings can support interdisciplinary applied education. Coloring and drawing tasks can be connected to science, environmental education, language, local culture, and thematic learning. For example, students may color local plants or animals while learning object characteristics, create visual sequences to support storytelling, or use foreground-middle ground-background organization to represent environments. Such applications position visual art as a learning tool rather than an isolated subject.

Fifth, teacher professional development should include visual-literacy assessment and children's artistic development. Teachers need practical knowledge for distinguishing technical difficulty from creative choice, providing feedback without suppressing experimentation, selecting developmentally appropriate media, and using student artwork as evidence for planning subsequent instruction. Applied art education should therefore combine artistic technique, child development, assessment literacy, and pedagogical scaffolding.

Finally, school-based art activities and competitions should be designed to preserve educational value. Competition can motivate participation, but the instructional process should prioritize exploration, feedback, inclusion, and developmental progress. The 369 works in this study demonstrate the potential of a large-scale school art event to become a source of pedagogical evidence for curriculum improvement, teacher reflection, and differentiated learning.

A central methodological implication of the findings concerns the distinction between observing visual features and attributing intentions to children. Payne (2023) cautions that artworks carry context-dependent meanings, whereas Li and Gong (2025) demonstrate how children may actively negotiate meaning through visual artefacts and accompanying conversation. Similarly, Buckle et al. (2024) combine children's drawings with verbal accounts in an iterative interpretive framework. In this study, unusual color choices, such as green or red faces are therefore reported as visible, non-naturalistic uses of color rather than taken to establish a particular emotion, personality, or motive.

Recent image-based studies further show that explicit visual coding frameworks can make large collections of children's work analytically informative while preserving the interpretive character of the research. Hou et al. (2026) describe the iterative development of codes for children's drawings, and Mai et al. (2025) provide an example of qualitative image analysis grounded in children's visual representations. These studies offer methodological comparisons, not direct validation of the present age-group interpretations, because the tasks, settings, and analytic questions differ.

The trustworthiness of the present findings should be evaluated in terms of credible cross-source interpretation, contextual transferability, dependable analytic decisions, and confirmability (Ahmed, 2024; Patterson et al., 2023). Reflective attention to researcher positioning is particularly relevant when evaluating children's art against adult expectations of realistic representation (Olmos-Vega et al., 2023). Future analysis of the archived works could improve dependability by documenting a codebook and ambiguous cases, and if multiple coders are used reporting how discrepancies were resolved; agreement statistics should only be introduced when justified by the underlying approach and actual coding process (Cole, 2024; Halpin, 2024).

Several limitations constrain inference. The works originated in a competition using a prepared image, so the visual patterns may partly reflect task instructions, media, time constraints, and prior art instruction. Age-group comparisons are descriptive rather than longitudinal and cannot establish developmental causality. Without verified category counts, formal coding records, and individually linked interview excerpts, claims about prevalence, coding consistency, or the intended meaning of particular color choices should remain provisional.

CONCLUSION

The study concludes that coloring-pattern works produced by primary school students aged 7–10 years in Wenang District display identifiable visual characteristics in technique, line, color, texture, form, and spatial organization. Students aged 7–8 years showed emerging hand control, increasingly directed lines, awareness of color-object relationships, initial spatial organization, and predominantly smooth texture. Students aged 9–10 years showed greater attention to detail, more differentiated and occasionally symbolic color use, improved color placement, and clearer organization of foreground, middle ground, and background.

Beyond describing children's artwork, the findings have direct implications for educational development and applied education. Coloring tasks can be developed into age-responsive instructional activities, formative assessment tools, visuomotor exercises, and interdisciplinary visual-learning media. The practical value of the study lies in translating observable features of children's work into teaching decisions: what techniques to demonstrate, what visual concepts to introduce, what feedback to provide, and how to differentiate learning according to students' developing capabilities. Thus, coloring should be positioned not merely as a recreational activity or competition product, but as an applied pedagogical medium for supporting visual literacy, creativity, fine-motor control, and reflective art learning.

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AUTHOR CONTRIBUTION STATEMENT

MWM conceptualized the study, collected and analyzed the data, interpreted the findings, and prepared and reviewed the manuscript.

AI DISCLOSURE STATEMENT

The author used an AI-assisted language tool during manuscript preparation to support English-language editing and formatting. The author reviewed and edited the content and takes full responsibility for the final manuscript.

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