

Improving Young Children's Fine Motor Skills Through Crayon Coloring Activities At Kristina Waur Kindergarten, Kei Besar, Southeast Maluku Regency

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Abstract

Fine motor skill acquisition represents a foundational aspect of early childhood development, underpinning children's later readiness for writing and independent daily activities. A preliminary observation at Kristina Waur Kindergarten, Kei Besar, Southeast Maluku Regency, found that most class A children aged 4-5 years had not yet mastered adequate fine motor coordination, shown by difficulty gripping coloring instruments, limited wrist flexibility, and untidy coloring within picture outlines. This study was carried out to describe how crayon coloring activities can be used to strengthen young children's fine motor abilities. A Classroom Action Research (CAR) design based on the Kemmis and Taggart spiral model was applied over two cycles, each comprising planning, action, observation, and reflection stages, involving 13 class A children as research subjects. Data were gathered through non-participatory observation, interviews with the school principal and class teacher, and documentation, then processed using a percentage-achievement formula referring to four developmental categories: Not Yet Developing (BB), Starting to Develop (MB), Developing According to Expectations (BSH), and Very Well Developed (BSB). The findings revealed that in Cycle I, 3 children (23.08%) remained in the Not Yet Developing category, 6 children (46.15%) were classified as Starting to Develop, and 4 children (30.77%) reached the Developing According to Expectations category. Following refinement of the coloring activities in Cycle II, the results improved markedly: 1 child (7.69%) was recorded as Starting to Develop, 4 children (30.77%) as Developing According to Expectations, and 8 children (61.54%) as Very Well Developed. These results confirm that theme-based crayon coloring activities, reinforced by consistent and individualized teacher guidance, are effective in accelerating fine motor development in children aged 4-5 years. Early childhood educators are encouraged to design varied, patterned coloring tasks as a routine part of daily learning to optimize children's fine motor readiness ahead of formal schooling.

Keywords: Fine Motor Skills; Early Childhood; Coloring Activity; Crayons; Classroom Action Research

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INTRODUCTION

Kindergarten is a form of formal preschool education designed to support children's physical and psychological growth outside the family environment before

they enter primary education. The learning activities provided at this level are intended to lay the groundwork for the attitudes, knowledge, skills, and creativity that children need in order to adapt to their environment and to continue growing in subsequent developmental stages.

Every child's growth reflects the optimal actualization of all developmental domains at each particular stage, encompassing religious and moral values, physical-motor abilities, cognition, language, and social-emotional competence. Among these domains, physical-motor development-comprising both gross and fine motor skills-plays a decisive role in supporting children's daily functioning and their readiness for later academic tasks. Gross motor skills involve the coordination of large muscle groups that enable children to jump, climb, run, and ride a bicycle, whereas fine motor skills involve the small muscles of the hand and fingers and are closely associated with tasks such as holding or manipulating small objects (Priyadi et al., 2024; Sintia et al., 2025).

Fine motor stimulation-through activities such as cutting, tracing, drawing, coloring, molding play-dough, and threading beads-needs to be provided consistently to kindergarten-aged children so that their fine motor abilities can develop optimally. Fine motor skills typically begin to progress rapidly once gross motor development has been sufficiently established, generally from around three years of age, when children start to show interest in holding writing or coloring tools, although their finger positioning and hand movements remain relatively stiff at this stage (Escolano-Perez et al., 2021).

Among the various stimulation activities available to teachers, coloring is widely regarded as an effective medium for supporting the overall development of young children, particularly their fine motor and cognitive abilities. Coloring functions as an educational tool that stimulates children to grip a coloring instrument correctly, move their wrists with increasing flexibility, and coordinate their eyes and hands to color within a given pattern. Beyond its motor benefits, coloring also nurtures children's creativity, self-expression, and imagination, while allowing parents and teachers to observe children's emotional states through their color choices and coloring style (Priyantoro & Hasanah, 2023; Rymanowicz, 2023).

Recent international studies confirm the continued relevance of coloring as a developmental intervention. Razin et al. (2025) demonstrated that both traditional paper-based and digitally-integrated coloring tasks contribute to measurable gains in preschoolers' fine motor proficiency, although structured, guided coloring on paper remains highly effective in typical classroom settings. Similarly, Roseli et al. (2024) reported that consistent, teacher-guided coloring practice in kindergarten settings is strongly associated with improvements in grip strength, wrist rotation, and visual-motor coordination. A related classroom action research study by Sintia et al. (2025) further found that hands-on, activity-based interventions-including patterned coloring-produced statistically significant increases in children's fine motor scores across intervention cycles. These findings collectively support the theoretical proposition that fine motor skills serve as a critical precursor to formal writing readiness (Flores et al., 2023; Le et al., 2023).

Preliminary observation conducted by the researcher at Kristina Waur Kindergarten revealed that the majority of class A children had not yet developed optimal fine motor coordination. During coloring activities, many children were

unable to color evenly or neatly within the given outlines; teachers, meanwhile, tended to simply hand out uncolored pictures for children to color without providing structured guidance or graduated activities. This condition motivated the researcher to conduct further study on efforts to develop children's fine motor skills through crayon coloring activities at Kristina Waur Kindergarten, Kei Besar, Southeast Maluku Regency.

Based on this background, the research problem addressed in this study is: how can crayon coloring activities be implemented to improve the fine motor development of children at Kristina Waur Kindergarten, Kei Besar, Southeast Maluku Regency? Accordingly, this study aims to describe the efforts undertaken to improve children's fine motor skills through crayon coloring activities at the same kindergarten.

METHODOLOGY

This study employed a Classroom Action Research (CAR) design, following the model proposed by Arikunto (2013), which consists of four interrelated stages implemented cyclically: (1) planning, (2) action, (3) observation, and (4) reflection. This design was chosen because it allows the researcher to directly evaluate and refine an instructional intervention within an authentic classroom setting across successive cycles.

The research was conducted at Kristina Waur Kindergarten, located in Waur Village, Kei Besar Subdistrict, Southeast Maluku Regency, Maluku Province, during November 2025. The research subjects were 13 class A children aged 4-5 years.

The primary research instrument was an observation sheet developed with reference to the Regulation of the Minister of Education and Culture Number 137 of 2014, comprising three indicators of fine motor development: (1) the ability to grip a coloring instrument, (2) the flexibility of wrist movement, and (3) hand-eye coordination in coloring a picture neatly. Data were collected through direct classroom observation, end-of-cycle assessment, and photographic documentation of the teaching-learning process.

The research procedure in each cycle involved four stages. In the planning stage, the researcher determined the learning theme, prepared the daily lesson plan (RPPH), assembled the coloring media (pattern pictures, crayons, and coloring sheets), and prepared the observation instrument and documentation tools. In the action stage, learning activities were implemented following the prepared lesson plan, consisting of opening activities, core coloring activities, recalling, and closing activities. In the observation stage, the researcher and a collaborator observed children's fine motor performance using the observation sheet. In the reflection stage, the results of each cycle were evaluated collaboratively to identify strengths and weaknesses that informed refinements for the subsequent cycle.

Data were analyzed using a descriptive quantitative approach, in which observation scores were converted into percentages using the following formula:

$$\text{Percentage} = \frac{\text{total score obtained by the child} \times 100\%}{\text{number of children} \times \text{maximum score}}$$

The resulting percentages were then interpreted using four developmental categories adapted from the national early childhood education assessment

guidelines: Not Yet Developed (BB, 0-25%), Starting to Develop (MB, 26-50%), Developing as Expected (BSH, 51-75%), and Very Well Developed (BSB, 76-100%). The research was considered successful if the average percentage of children's fine motor development reached at least 80%, within the Very Well Developed category.

RESULTS AND DISCUSSION

a. Research Results

Cycle I was implemented across two learning sessions with the themes of plants: leaf types (first meeting) and fruit types (second meeting). In each session, children were guided to color a pattern picture using crayons following the opening, core, recalling, and closing stages of the lesson plan. Observation focused on three indicators: the child's ability to grip the coloring tool, the flexibility of wrist movement, and hand-eye coordination in coloring neatly.

Table 1. Observation Results of Children's Fine Motor Skills in Cycle I

N o.	Child Code	Ite m 1 (Grip)	Ite m 2 (Wrist)	Item 3 (Coordinati on)	Tot al	Me an	%
1	EBK a	1	1	1	3	1.0	25.0
2	DOh o	1	1	1	3	1.0	25.0
3	DXu w	1	1	1	3	1.0	25.0
4	FEBo	2	1	1	4	1.3	32.5
5	FBoI	2	1	1	4	1.3	32.5
6	GRN g	2	2	1	5	1.7	42.5
7	MDO h	2	2	1	5	1.7	42.5
8	MCH e	2	2	2	6	2.0	50.0
9	LWB o	2	2	2	6	2.0	50.0
0	VER u	3	2	2	7	2.3	57.5
1	YSa m	3	2	2	7	2.3	57.5
2	KPFa	3	3	3	9	3.0	75.0
3	SNGu	3	3	3	9	3.0	75.0
Sum / Mean					71. 00	1.8 2	45.5 1

Note: Item 1 = tool-gripping ability; Item 2 = wrist flexibility; Item 3 = hand-eye coordination. Score categories: 1 = Not Yet Developed (0-25%); 2 = Starting to Develop (26-50%); 3 = Developing as Expected (51-75%); 4 = Very Well Developed (76-100%). Source: Field data, 2025.

As presented in Table 1, the observation results in Cycle I show that 3 children (23.08%) remained in the Not Yet Developing category, 6 children (46.15%) were classified as Starting to Develop, and 4 children (30.77%) reached the Developing According to Expectations category, with an overall mean score of 1.82 (45.51%). Field notes recorded that a number of children still held the crayon stiffly, rotated their wrists with limited flexibility, and had not yet managed to color within the picture outlines neatly. Reflecting on Cycle I, the researcher and collaborating teacher identified several issues to be addressed in the following cycle: (1) the improvement in children's fine motor skills was still limited, (2) children's enthusiasm and motivation during coloring were not yet optimal, and (3) a few children were easily distracted and occasionally disrupted their peers during the activity.

Cycle II was subsequently implemented across two learning sessions with the themes of plants: plant stems (first meeting) and plant roots (second meeting). Based on the reflection from Cycle I, the researcher strengthened teacher guidance during the activity, provided more varied coloring patterns, and gave closer individual attention to children who had experienced difficulty in the previous cycle.

Table 2. Observation Results of Children's Fine Motor Skills in Cycle II

No .	Child Code	Item 1 (Grip)	Item 2 (Wrist)	Item 3 (Coordination)	Total	Mean	%
1	EBKa	2	2	1	5	1.7	42.5
2	DOho	3	3	2	8	2.7	67.5
3	DXu w	3	3	2	8	2.7	67.5
4	FEBo	3	3	3	9	3.0	75.0
5	FBol	3	3	3	9	3.0	75.0
6	GRN g	4	3	3	10	3.3	82.5
7	MDO h	4	3	3	10	3.3	82.5
8	MCH e	4	3	3	10	3.3	82.5
9	LWB o	4	4	3	11	3.7	92.5
10	VERu	4	4	3	11	3.7	92.5
11	YSam	4	4	3	11	3.7	92.5
12	KPFa	4	4	4	12	4.0	100.0
13	SNGu	4	4	4	12	4.0	100.0
Sum / Mean					126.00	3.23	80.77

Note: Item 1 = tool-gripping ability; Item 2 = wrist flexibility; Item 3 = hand-eye coordination. Score categories: 1 = Not Yet Developed (0-25%); 2 = Starting to Develop (26-50%); 3 = Developing as Expected (51-75%); 4 = Very Well Developed (76-100%). Source: Field data, 2025.

Table 2 shows a considerable shift in Cycle II: 1 child (7.69%) was recorded as Starting to Develop, 4 children (30.77%) reached the Developing According to Expectations category, and 8 children (61.54%) attained the Very Well Developed category, with an overall mean score rising to 3.23 (80.77%), surpassing the predetermined success indicator of 80%. Field notes indicated that most children were by then able to hold the crayon correctly, rotate their wrists with greater ease, and color the pictures neatly within the outlines. Reflection on Cycle II confirmed that the learning objectives had been achieved, marked by three notable outcomes: (1) children's fine motor development reached the expected level for the majority of the class, (2) children's enthusiasm and motivation during coloring activities were consistently high, and (3) nearly all children remained engaged and attentive throughout the sessions. On this basis, the action research was concluded after two cycles, as the success criteria had been met.

Interviews with the school principal and the class teacher supported the observation findings. Prior to the coloring intervention, the principal noted that class A children commonly struggled with fine motor tasks and grew tired quickly during activities such as assembling or tracing. The class teacher likewise reported that children frequently asked for assistance and showed limited independence in completing hands-on tasks. Following the implementation of themed crayon coloring, both informants observed a gradual rise in children's confidence and independence, noting that the activity introduced an enjoyable variation into daily learning that helped sustain children's focus and motivation.

DISCUSSION

The findings of this study point to a clear developmental shift across the two cycles. In Cycle I, the majority of children were still concentrated in the Not Yet Developing and Starting to Develop categories, with only 4 children (30.77%) reaching the Developing According to Expectations level. By Cycle II, this pattern had reversed, with 8 children (61.54%) attaining the Very Well Developed category and none remaining in the Not Yet Developing group. This progression suggests that a structured coloring intervention, delivered with adequate teacher guidance and graduated practice, is an effective strategy for enhancing fine motor development in children aged 4-5 years.

Coloring is well suited to fine motor stimulation in kindergarten settings because it directly exercises the sub-skills that later underpin handwriting: gripping a tool correctly, rotating and flexing the wrist, and coordinating the eyes and hands. This is in line with Pamadhi's (2011) observation that young children generally enjoy applying color through drawing or filling patterned areas, and that this enjoyment tends to maximize the intended stimulation effect. The Regulation of the Minister of National Education Number 58 of 2009 concerning Early Childhood Education Standards similarly specifies that children aged 4-5 years are expected to imitate vertical and horizontal lines, color simple pictures, and place objects into matching containers, abilities that correspond closely to the fine motor indicators observed in this study.

These findings are in line with recent international research on coloring-based interventions for early childhood fine motor development. Razin et al. (2025) found that both digitally-integrated and traditional paper-based coloring tasks contributed

to notable gains in preschoolers' fine motor proficiency, underscoring coloring's value as a developmental medium regardless of the specific tool used. Likewise, Roseli et al. (2024) reported that repeated, guided coloring practice was closely linked to improvements in children's grip strength and visual-motor integration. Sintia et al. (2025) documented a comparable increase in children's fine motor scores following a structured, hands-on classroom action research intervention, lending further support to the cyclical CAR approach adopted in the present study.

From a developmental perspective, fine motor coordination is closely tied to visual-motor integration, which combines visual-spatial perception with fine motor output and depends heavily on hand-eye coordination (Flores et al., 2023). Because coloring requires children to track a visual boundary while directing precise hand movements within it, the activity functions as a naturally integrated training task for this capacity. Le et al. (2023) further showed that targeted fine motor training is associated with measurable gains in early literacy readiness, suggesting that the benefits observed in this study may extend beyond motor competence to support children's broader school readiness.

Teacher guidance appears to be a decisive factor distinguishing the outcomes of the two cycles. In Cycle I, instruction was still relatively unstructured, which corresponded with limited engagement and modest gains. In Cycle II, the researcher offered closer individual attention, clearer step-by-step direction, and a wider variety of thematic patterns, changes that coincided with a marked increase in children's motivation, focus, and fine motor scores. This supports the view that the effectiveness of coloring as a developmental medium depends not only on the activity itself but on the quality of the pedagogical scaffolding that accompanies it (Ford et al., 2021; Raynal et al., 2022).

Overall, the shift from a predominance of Not Yet Developing and Starting to Develop results in Cycle I to a predominance of Very Well Developed results in Cycle II confirms that structured, theme-based crayon coloring activities, implemented with consistent teacher guidance, constitute an effective, low-cost, and easily replicable strategy for developing fine motor skills among kindergarten children. These findings reinforce the broader body of contemporary literature affirming coloring's role as both a creative and a developmentally functional activity within early childhood education (Priyantoro & Hasanah, 2023; Rymanowicz, 2023).

CONCLUSIONS

This study concludes that crayon coloring activities using themed pattern pictures of leaves, fruits, stems, and roots effectively improved the fine motor skills of children aged 4-5 years at Kristina Waur Kindergarten, Kei Besar, Southeast Maluku Regency. In Cycle I, 3 children (23.08%) were categorized as Not Yet Developing, 6 children (46.15%) as Starting to Develop, and 4 children (30.77%) as Developing According to Expectations; many children still held coloring tools stiffly, showed limited wrist flexibility, and had not yet colored pictures neatly. Following closer teacher guidance and more varied thematic activities in Cycle II, the results improved substantially, with 1 child (7.69%) categorized as Starting to Develop, 4 children (30.77%) as Developing According to Expectations, and 8

children (61.54%) as Very Well Developed, surpassing the predetermined success indicator.

These findings affirm that structured, consistently guided coloring activities are an effective and practical intervention for enhancing fine motor readiness in early childhood settings. Teachers are encouraged to continue developing children's fine motor skills through varied crayon coloring activities to make learning more engaging and effective, while parents are encouraged to support this development by motivating children to practice coloring activities at home. Future research may consider extending the intervention period, incorporating a comparison group, and examining the transfer of fine motor gains to early writing readiness, in line with recent international evidence on the broader academic benefits of fine motor stimulation.

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