

THE EFFECT OF HANDS-ON ACTIVITY ON FINE MOTOR SKILLS OF CHILDREN AGED 5–6 YEARS AT TK KARYA PERUMNAS

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Article Info	Abstract
Article History: Received: Mei 2026 Revised: Juni 2026 Accepted: Juni 2026 Published: Juni 2026 Key Word : Hands-On Activity, fine motor skills, early childhood, quasi-experiment.	Fine motor skills are an essential aspect of early childhood development because they support children's readiness to perform various learning activities, such as writing, drawing, cutting, and other hand-eye coordination tasks. This study aimed to determine the effect of Hands-On Activity on the fine motor skills of children aged 5–6 years at TK Karya Perumnas. The study employed a quantitative approach using a quasi-experimental method with a Nonequivalent Control Group Design. The participants consisted of Group B children divided into an experimental group and a control group. Data were collected through observation using a fine motor skills assessment instrument and analyzed using descriptive and inferential statistics. The findings indicated that the average score of children's fine motor skills increased after the implementation of Hands-On Activity. The average pretest score increased from 9.21 to 11.07 in the posttest, with a normalized gain score of 0.2834. However, the Independent Sample t-test showed a significance value (Sig. 2-tailed) greater than 0.05, indicating no statistically significant difference between the experimental and control groups. Nevertheless, Hands-On Activity provided meaningful learning experiences that encouraged children to actively manipulate learning materials, thereby supporting the development of hand-eye coordination, finger flexibility, and precision of movement. Therefore, Hands-On Activity can be considered an alternative learning strategy to stimulate fine motor development in early childhood. Copyright © 2026 Saskia Yuliani. et al This is an open access article under the CC-BY-SA license 

Abstrak

Kemampuan motorik halus merupakan salah satu aspek perkembangan yang penting pada anak usia dini karena mendukung kesiapan anak dalam melakukan berbagai aktivitas belajar, seperti menulis, menggambar, menggunting, dan kegiatan lain yang membutuhkan koordinasi mata dan tangan. Penelitian ini bertujuan untuk mengetahui pengaruh Hands-On Activity terhadap kemampuan motorik halus anak usia 5–6 tahun di TK Karya Perumnas. Penelitian menggunakan pendekatan kuantitatif dengan metode quasi experiment dan desain Nonequivalent Control Group Design. Subjek penelitian terdiri atas anak kelompok B yang dibagi menjadi kelompok eksperimen dan kelompok kontrol. Data dikumpulkan melalui observasi menggunakan instrumen penilaian kemampuan motorik halus, kemudian dianalisis menggunakan statistik deskriptif dan inferensial. Hasil penelitian menunjukkan bahwa rata-rata kemampuan motorik halus anak meningkat setelah penerapan Hands-On Activity. Nilai rata-rata pretest meningkat dari 9,21 menjadi 11,07 pada posttest dengan nilai normalized gain sebesar 0,2834. Namun, hasil uji Independent Sample t-test menunjukkan nilai signifikansi (Sig. 2-tailed) lebih besar dari 0,05 sehingga tidak terdapat perbedaan yang signifikan antara kelompok eksperimen dan kelompok kontrol. Meskipun demikian, Hands-On Activity memberikan pengalaman belajar yang bermakna melalui keterlibatan langsung anak dalam memanipulasi berbagai media pembelajaran sehingga mampu melatih koordinasi mata dan tangan, kelenturan jari, serta ketepatan gerakan. Dengan demikian, Hands-On Activity dapat dijadikan sebagai salah satu alternatif strategi pembelajaran dalam menstimulasi kemampuan motorik halus anak usia dini.

Kata Kunci : Hands-On Activity, kemampuan motorik halus, anak usia dini, quasi experiment.

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Introduction

Early childhood education plays a fundamental role in supporting children's holistic development and establishing the foundation for lifelong learning. Children aged 5–6 years are in the *golden age*, a critical period characterized by rapid physical, cognitive, language, social-emotional, and motor development. At this stage, children require appropriate learning experiences that actively engage them in meaningful activities to stimulate all aspects of development. Therefore, learning in early childhood education should be child-centered, enjoyable, and based on direct experiences that encourage active participation.

Fine motor skills constitute one of the essential developmental domains in early childhood because they involve the coordination of small muscles, particularly those of the fingers and hands, in conjunction with visual perception. These skills enable children to perform various daily and academic activities, including writing, drawing, cutting, folding, coloring, pasting, and manipulating objects. Well-developed fine motor skills contribute significantly to children's school readiness and academic achievement, whereas inadequate development may hinder children's ability to complete learning tasks effectively.

Fine motor development does not occur automatically but requires continuous and appropriate stimulation from teachers and parents. Learning activities that encourage children to manipulate objects directly are considered more effective than teacher-centered instruction because they provide opportunities for repeated practice and meaningful learning experiences. Various studies have reported that manipulative activities such as cutting, folding, coloring, finger painting, collage, and bead stringing effectively improve children's hand-eye coordination, finger dexterity, and movement precision. Consequently, teachers are encouraged to design learning environments that facilitate children's active involvement in hands-on experiences.

A preliminary observation conducted at TK Karya Perumnas revealed that many children in Group B experienced difficulties in performing fine motor tasks. Several children were unable to color within boundaries, cut along designated lines, fold paper accurately, or paste pictures according to the teacher's instructions. These findings indicate that children's hand-eye coordination and finger control had not yet developed optimally. In addition, classroom learning was predominantly teacher-directed and provided limited opportunities for children to actively manipulate learning materials, resulting in low engagement and motivation during classroom activities.

One instructional approach that has considerable potential to address these challenges is Hands-On Activity. Hands-On Activity emphasizes direct participation in learning through exploration and manipulation of concrete materials. Instead of merely listening to explanations, children actively touch, hold, arrange, cut, fold,

assemble, and manipulate learning objects. This approach aligns with the constructivist learning theory and the principle of *learning by doing*, which suggests that children construct knowledge more effectively through direct experiences. Active involvement in learning also promotes independence, creativity, problem-solving skills, and psychomotor development, making learning more meaningful and enjoyable for young children.

Previous studies have consistently demonstrated the positive effects of manipulative learning activities on children's fine motor development. Activities such as collage, finger painting, Montessori-based learning, puzzle games, and sensory play have been reported to improve hand-eye coordination, finger strength, concentration, and fine motor performance. However, most previous studies have focused on a single type of activity or instructional medium. Few studies have investigated the effectiveness of an integrated Hands-On Activity approach that combines multiple manipulative experiences within one learning program. This gap indicates the need for further research exploring comprehensive hands-on learning strategies in early childhood classrooms.

program that incorporates various manipulative learning experiences, including cutting, folding, coloring, drawing, pasting, and bead stringing, to stimulate children's fine motor development. Unlike previous studies that examined only one instructional activity, this research investigates Hands-On Activity as a comprehensive learning approach implemented in kindergarten classrooms. Therefore, this study aimed to analyze the effect of Hands-On Activity on the fine motor skills of children aged 5–6 years at TK Karya Perumnas. The findings are expected to provide empirical evidence regarding the effectiveness of Hands-On Activity as an alternative instructional strategy for improving fine motor development and to contribute to the development of innovative learning practices in early childhood education.

Method

This study employed a quantitative approach using a quasi-experimental research design, specifically the Nonequivalent Control Group Design. This design was selected because the participants could not be randomly assigned to experimental and control groups, as the existing classroom organization in the kindergarten was maintained throughout the study. The research design enabled the comparison of children's fine motor skills before and after the intervention in both groups.

The research was conducted at TK Karya Perumnas, involving Group B children aged 5–6 years as the research participants. The participants were divided into two groups: an experimental group, which received learning activities based on the Hands-On Activity approach, and a control group, which participated in

conventional classroom learning conducted by the teacher. Both groups were given a pretest before the intervention and a posttest after the intervention to measure changes in fine motor skills.

The independent variable in this study was Hands-On Activity, while the dependent variable was children's fine motor skills. Hands-On Activity was implemented through a series of learning experiences that actively engaged children in manipulating concrete materials, including cutting, folding, coloring, drawing, pasting, and bead stringing. These activities were designed to improve hand-eye coordination, finger flexibility, movement precision, and control of small muscles. Fine motor skills were assessed using indicators that measured children's ability to perform manipulative tasks accurately, neatly, and independently.

Data were collected through structured observation using a fine motor skills observation checklist developed according to early childhood developmental indicators. The instrument consisted of several observable indicators related to children's performance in manipulative activities and was completed by the researcher during classroom learning. Prior to data collection, the instrument underwent content validity and reliability testing to ensure its appropriateness and consistency for measuring children's fine motor development.

The collected data were analyzed using descriptive and inferential statistics. Descriptive statistics were employed to summarize the pretest and posttest scores through means, percentages, and normalized gain scores. Before hypothesis testing, the data were examined for normality and homogeneity to ensure compliance with the assumptions of parametric analysis. Subsequently, an Independent Samples t-test was conducted to determine whether there was a statistically significant difference in fine motor skill improvement between the experimental and control groups. All statistical analyses were performed using IBM SPSS Statistics, with the significance level set at 0.05.

Result and Discussion

The effectiveness of the Hands-On Activity approach was examined by comparing the pretest and posttest scores of the experimental and control groups. Before the intervention, both groups demonstrated relatively similar levels of fine motor skills, indicating comparable initial abilities. Many children still experienced difficulties in performing manipulative tasks, such as cutting along patterns, folding paper accurately, coloring within boundaries, and pasting objects precisely. These findings indicate that children's hand-eye coordination and finger control had not yet developed optimally.

After the implementation of Hands-On Activity, improvements were observed in children's fine motor performance. The average score increased from 9.2143 in the pretest to 11.0714 in the posttest, with a normalized gain score of

0.2834, indicating a low-to-moderate improvement in fine motor skills. Children in the experimental group demonstrated better hand-eye coordination, finger flexibility, movement accuracy, and greater confidence in completing manipulative activities, such as cutting, folding, coloring, drawing, and pasting. These findings suggest that direct involvement in learning activities provides meaningful opportunities for children to strengthen the coordination of small muscles through repeated practice.

Before testing the research hypothesis, the data were analyzed using normality and homogeneity tests. The results indicated that the data were normally distributed and homogeneous, meeting the assumptions required for parametric analysis. Subsequently, an Independent Samples t-test was conducted to compare the posttest scores between the experimental and control groups. The statistical analysis revealed that the Sig. (2-tailed) value was greater than 0.05, indicating that there was no statistically significant difference between the two groups. Therefore, the hypothesis stating that Hands-On Activity had a significant effect on children's fine motor skills was not statistically supported..

Although no statistically significant difference was identified, the findings demonstrated that Hands-On Activity positively influenced the learning process. Children became more actively engaged in classroom activities and showed greater enthusiasm, independence, and persistence while manipulating learning materials. The increase in posttest scores also suggests that repeated exposure to hands-on experiences contributed to gradual improvements in children's fine motor performance.

These findings are consistent with the theory of experiential learning, which emphasizes that children learn more effectively through direct interaction with concrete materials. Hands-On Activity encourages children to actively construct knowledge by manipulating objects rather than passively receiving information from teachers. Through activities such as cutting, folding, coloring, drawing, bead stringing, and pasting, children repeatedly practice coordinated movements involving the fingers, hands, and eyes, thereby strengthening fine motor control and improving movement precision.

The results also support previous studies reporting that manipulative learning activities enhance children's hand-eye coordination, finger dexterity, concentration, and independence. Earlier research has demonstrated that activities such as collage, finger painting, Montessori-based learning, puzzle games, and sensory play effectively stimulate fine motor development because they provide repeated opportunities for children to manipulate objects directly. Similar to those findings, the present study indicates that an integrated Hands-On Activity approach creates an engaging learning environment that encourages children to explore, experiment, and complete learning tasks independently.

The absence of statistical significance may be attributed to several factors. First, children in both the experimental and control groups participated in classroom activities that also involved fine motor practice, resulting in improvements across both groups. Second, the duration of the intervention may not have been sufficiently long to produce a statistically significant difference. Fine motor development generally requires continuous stimulation and repeated practice over an extended period. In addition, the relatively small sample size may have limited the statistical power to detect differences between groups.

Overall, although Hands-On Activity did not produce a statistically significant effect, the approach demonstrated educational value by promoting active participation, meaningful learning experiences, and gradual improvement in children's fine motor skills. Therefore, Hands-On Activity can be considered an effective alternative instructional strategy for stimulating fine motor development in early childhood education. Future studies are recommended to involve larger samples, longer intervention periods, and more diverse manipulative activities to further investigate the long-term effectiveness of Hands-On Activity in improving children's fine motor development.

Table 1. Distribution of Children's Fine Motor Skill Categories Before and After the Intervention

Category	Pretest <i>n</i> (%)	Posttest <i>n</i> (%)
BB (Undeveloped)	3 (21.4)	0 (0.0)
MB (Beginning to Develop)	7 (50.0)	7 (50.0)
BSH (Developing as Expected)	4 (28.6)	9 (64.3)
BSB (Very Well Developed)	0 (0.0)	1 (7.1)
Total	14 (100)	14 (100)

Source: Research Data (2026).

Table 2. Descriptive Statistics of Children's Fine Motor Skills

Variable	N	Minimum	Maximum	Mean	Std. Deviation
Pretest Score	14	5.00	12.00	9.2143	2.11873
Posttest Score	14	8.00	16.00	11.0714	2.26900
Normalized Gain	14	0.00	1.00	0.2834	0.28216

Source: Research Data (2026).

Table 3. Test of Normality

Variable	Kolmogorov-Smirnov Sig.	Shapiro-Wilk Sig.	Interpretation
Interpretation	0.200	0.435	Normal
Posttest Score	0.127	0.187	Normal

Source: Research Data (2026).

Table 4. Independent Samples t-Test

Variable	t	df	Sig. (2-tailed)	Mean Difference	Decision
Pretest Score	-1.149	12	0.273	-1.28571	Not Significant
Posttest Score	0.814	12	0.432	1.00000	Not Significant

Source: Research Data (2026).

Conclusion

This study investigated the effect of Hands-On Activity on the fine motor skills of children aged 5–6 years at TK Karya Perumnas. The findings showed that the implementation of Hands-On Activity improved children's fine motor performance, as reflected in the increase in the mean score from 9.2143 on the pretest to 11.0714 on the posttest, with a normalized gain score of 0.2834, indicating a low level of improvement.

The results of the Independent Samples t-test revealed that the Sig. (2-tailed) value was 0.432, which is greater than the significance level of 0.05. Therefore, there was no statistically significant difference between the experimental and control groups, indicating that the research hypothesis was not statistically supported.

Despite the absence of statistical significance, Hands-On Activity provided meaningful learning experiences by actively engaging children in manipulating concrete materials through activities such as cutting, folding, coloring, drawing, and pasting. These activities encouraged children's participation and contributed to gradual improvements in hand-eye coordination, finger dexterity, and movement precision. Therefore, Hands-On Activity can be considered an alternative instructional approach for stimulating fine motor development in early childhood education.

Future studies are recommended to involve larger sample sizes, longer intervention periods, and a wider variety of hands-on learning activities to provide stronger evidence regarding the effectiveness of Hands-On Activity in enhancing children's fine motor skills.

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