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Instructional Approaches in Early Childhood Education to Development Fine Motor Skills: A Qualitative Study

Ita Ul Faizah Al Muthaharah*
Universitas Trunojoyo Madura
INDONESIA

Ma'rifatul Amellya Jariyah
Universitas Trunojoyo Madura
INDONESIA

Dinar Syafhira
Universitas Trunojoyo Madura
INDONESIA

Siti Amrina Rosada
Universitas Trunojoyo Madura
INDONESIA

Dwi Rayyanatul Jannah
Universitas Trunojoyo Madura
INDONESIA

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Abstract

ABSTRACT
Background of study: Fine motor development is a key component of early childhood growth, supporting tasks such as writing, cutting, and handling small objects. Limited stimulation during this period can lead to delays affecting academic readiness and self-confidence. At TK Anugerah, educational activities target holistic development—physical, emotional, and cognitive. Among these, fine motor development has received particular focus due to noticeable disparities among children aged 5–6 years.
Aims and scope of paper: This study aims to explore the development of fine motor skills through educational activities at TK Anugerah, located in Tanjung Jati, Kamal, Bangkalan. It focuses on how educators facilitate fine motor growth, assess current motor skill conditions, utilize instructional strategies and learning media, and perceive the importance of motor development in early childhood education.
Methods: This qualitative descriptive study using classroom observation and informal interviews with teaching staff. Data collection examined how activities were implemented, children's motor skill conditions, and teacher responses to developmental challenges.
Results: Findings revealed that while most children demonstrated age-appropriate fine motor skills, some exhibited delays. Teachers responded with targeted stimulation using available materials such as beach sand, modeling clay, textured objects, and art activities like tearing paper and collage-making. Educators emphasized creativity and engaging media as crucial for effective learning.
Conclusion: Fine motor development in early childhood is shaped by teacher strategies, media use, and responsive interventions. At TK Anugerah, educators play a central role in designing meaningful learning experiences. Continued provision of creative materials and ongoing teacher training is recommended to optimize fine motor stimulation and support children's holistic growth.

*** Corresponding author:**
Ita Ul Faizah Al Muthaharah
Department of Early Childhood Education
Universitas Trunojoyo Madura, INDONESIA.
Email: itaulf@gmail.com

INTRODUCTION

Fine motor skills refer to the ability to perform movements that require the coordination of small muscle groups, particularly those in the hands and fingers, in conjunction with precise eye-

hand coordination [1], [2]. These skills are essential for carrying out tasks that involve accuracy, control, and dexterity. Such tasks include grasping small objects like beads or seeds, holding a pencil with the correct grip, cutting paper with scissors, applying glue, crumpling paper, tying shoelaces, buttoning shirts, and zipping clothes. In early childhood, the development of fine motor skills is foundational in preparing children for school-related tasks and everyday self-care activities [3], [4], [5], [6], [7], [8], [9], [10], [11].

In early learning settings, activities such as drawing, coloring, cutting out shapes, and pasting materials onto paper depend heavily on the refinement of fine motor skills. If these abilities are not adequately developed, children may experience challenges in executing basic motor functions such as folding, gripping, pinching, and finger coordination [12], [13], [14]. These difficulties can interfere with the development of writing skills and delay independence in everyday tasks, thereby affecting a child's self-efficacy, confidence, and school readiness.

The development of fine motor abilities in young children requires structured, repetitive, and meaningful engagement through planned educational activities [15], [16], [17], [18], [19], [20]. Educators play a vital role in identifying children's developmental needs and providing appropriate stimulation. Activities designed to improve fine motor control often focus on tasks that strengthen finger muscles and improve coordination. For example, exercises such as forming a concave palm, using the thumb and index finger to pick up small objects (pincer grasp), or moving objects using the middle and ring fingers help children practice and refine essential hand movements.

In early childhood classrooms, these skills can be introduced through engaging and developmentally appropriate activities. Simple tasks such as crumpling paper, tearing it into strips, or rolling it into small balls serve as effective entry-level exercises. More creative tasks, such as collage-making, can be particularly stimulating. For instance, children may be asked to arrange colorful straws or paper pieces based on a given picture and glue them in place. These types of activities not only engage children in meaningful, hands-on tasks but also develop their fine motor skills in a way that is both unconscious and enjoyable. When children are engaged in play-based learning, their physical development progresses naturally alongside cognitive and social-emotional growth [21], [22], [23].

Early childhood education (ECE) serves as a critical platform for fostering children's comprehensive development, including their physical, emotional, social, moral, and cognitive domains. The period from birth to six years of age is often referred to as the "golden age" of development—a time of rapid brain growth and the ideal window for foundational learning. During this phase, children are highly receptive to stimulation, making it essential to implement educational strategies that promote holistic development. Among the core developmental domains addressed in ECE programs, physical-motor development is a fundamental area, typically categorized into gross motor and fine motor development [24], [25], [26], [27].

While gross motor skills involve large muscle groups and activities such as jumping, running, or throwing a ball, fine motor skills involve smaller, more precise movements [15], [17], [28], [29]. These skills are vital for enabling children to interact with their environment effectively and complete tasks that require hand-eye coordination and finger dexterity. The mastery of fine motor skills is not only crucial for academic tasks such as writing and drawing but also for personal care routines like feeding oneself, buttoning clothes, and brushing teeth.

At TK Anugerah, a kindergarten located in Tanjung Jati, Kamal, Bangkalan, East Java, educators have become increasingly aware of the importance of integrating fine motor development into the daily curriculum. Observations conducted at the school revealed that most children aged 5–6 years demonstrated age-appropriate motor abilities. However, a number of children exhibited signs of delayed fine motor development. These delays manifested in difficulties with tasks such as holding pencils properly, using scissors, or manipulating small objects.

To address these challenges, teachers at TK Anugerah implemented various strategies aimed at providing direct and targeted stimulation. One of the primary methods involved the

use of tactile and sensory-rich materials readily available in the classroom and the surrounding environment. For instance, children were encouraged to squeeze beach sand through their fingers, manipulate modeling clay, explore rough textures using small stones, and engage in hands-on art activities such as tearing paper and creating collages. These tactile experiences were designed not only to strengthen fine motor coordination but also to improve children's sensory awareness and finger dexterity.

According to Ms. Dila Kanti Rahayu, a teacher at TK Anugerah, fine motor development is not merely about physical ability but also about nurturing children's confidence and independence. She emphasized that when children are able to complete tasks such as cutting, gluing, or drawing independently, they build a sense of accomplishment that contributes to their overall growth. Moreover, early mastery of fine motor skills is seen as an important predictor of later academic success, particularly in areas such as writing, mathematics, and science, where precise manipulation and hand control are required.

In this study, observational methods were employed to document how fine motor skill development is integrated into the educational practices at TK Anugerah. The study aimed to assess the current condition of children's fine motor abilities, identify the specific instructional activities used by teachers to promote development, and evaluate how teachers respond to children facing developmental challenges. Data were collected through direct classroom observations and informal interviews with the teaching staff.

The observations revealed that effective fine motor development requires a combination of creative, engaging activities and responsive teaching strategies. Teachers at TK Anugerah were observed to actively adapt learning tasks based on children's individual needs. For example, children who struggled with scissors were given alternative activities, such as tearing paper or pressing modeling clay into shapes, to build foundational strength and coordination. Teachers also ensured that children had access to a variety of learning media, allowing them to explore and develop fine motor skills through multiple pathways.

One important insight from this study is the role of creative use of materials in promoting motor development. Instead of relying solely on expensive educational tools, the teachers at TK Anugerah made use of everyday materials—such as straws, sand, old newspapers, leaves, and colored paper—to design stimulating learning activities. This approach not only promoted sustainability but also encouraged children to interact with natural and familiar objects, which can enhance sensory learning.

Another key finding is the significance of teacher engagement and flexibility. Teachers who observed developmental delays in their students were quick to intervene with targeted exercises and individual support. This responsive approach ensures that each child receives the attention necessary to develop their abilities in line with their personal growth trajectory.

METHOD

Research Design

This study employed a qualitative descriptive research design. A qualitative descriptive approach aims to systematically and factually describe social phenomena—in this case, early childhood learning activities related to the development of fine motor skills. A qualitative approach is a research procedure that produces descriptive data in the form of written or spoken words from people and observable behavior. This approach seeks to understand the experiences of research subjects, including their behavior, perceptions, motivations, and actions, through non-numerical data collection and analysis [30].

Research Subjects

The subjects of this study were teachers and students at TK Anugerah, Bangkalan. The students were divided into two groups: Group A and Group B. A purposive sampling technique was used to select several children who exhibited challenges in developing fine motor skills.

Teachers involved in classroom instruction were also selected as key informants to provide insights into the teaching strategies and learning methods used.

Data Collection Techniques

Data were collected using two primary qualitative methods: interviews and observations. In-depth interviews were conducted with early childhood teachers to gain insights into their instructional practices, perceptions of students' fine motor skill development, and the challenges they face in facilitating learning. These interviews aimed to explore the subjective experiences and professional insights of educators directly involved in early childhood education. In addition to interviews, direct classroom observations were carried out to capture learning activities as they occurred in real time. These observations allowed the researcher to examine the interaction between teachers and students, as well as the specific strategies used to support fine motor skill development. Data from observations were recorded in detailed field notes and supplemented with structured observation sheets to ensure consistency and thorough documentation. The qualitative data collected included interview transcripts, observation notes, photographs, and relevant instructional documents, all of which contributed to a comprehensive understanding of the research context.

Data Analysis Techniques

The data collected in this study were analyzed using the interactive model of qualitative data [31]. This model consists of three interconnected steps: data reduction, data display, and conclusion drawing and verification. Data reduction involved organizing and simplifying the raw data obtained from interviews and observations to focus on the most relevant information aligned with the study's objectives. During this phase, the researcher filtered and coded the data to identify emerging themes and patterns. The second step, data display, involved presenting the data in a descriptive and narrative format that accurately represented classroom conditions and teaching practices. This allowed for clearer interpretation and facilitated comparison across different data sources. The final step, conclusion drawing and verification, consisted of interpreting the data to generate findings that addressed the research questions. The researcher then verified the credibility of these conclusions through triangulation, comparing data from multiple sources to ensure consistency and validity.

RESULTS AND DISCUSSION

Early childhood is a period of significant transformation characterized by rapid growth in cognitive, emotional, social, and physical domains. Within this context, fine motor development plays an essential role in shaping children's ability to perform daily tasks and engage in academic learning. As stated in the Indonesian Ministry of Education Regulation No. 146 of 2014 on the Early Childhood Education Curriculum, six developmental domains must be nurtured: religious and moral values, physical-motor development, cognitive abilities, language, social-emotional skills, and artistic expression. Among these domains, physical-motor development—particularly fine motor skills—holds unique importance, as it supports not only academic readiness but also the development of autonomy and self-confidence in young children.

Fine motor skills refer to coordinated movements involving the small muscles of the hands and fingers, often in conjunction with visual input. These skills are crucial for a wide range of activities including writing, coloring, buttoning clothes, tying shoelaces, pouring liquids, and handling utensils. According to Sumantri, fine motor ability is defined as the capacity to coordinate small muscle groups to execute tasks that require precision and control. When these skills are not sufficiently developed, children may experience difficulties in school and daily routines, which can have lasting effects on their overall growth and self-esteem.

This study was conducted at TK Anugerah, a kindergarten located in Tanjung Jati, Kamal, Bangkalan. Observations and interviews carried out on November 30, 2022, with teaching staff and classroom activities revealed that while most children aged 5–6 years at the school demonstrated age-appropriate fine motor skills, several were found to exhibit developmental delays in this area. These delays manifested as difficulties in gripping pencils, cutting shapes, folding paper evenly, or manipulating objects such as beads and clay with adequate control. In response, teachers implemented a variety of activities aimed at stimulating fine motor development using accessible materials, including modeling clay, white beach sand, pebbles, textured papers, and seeds.

Activities designed by teachers included kneading and shaping modeling clay, tearing and gluing paper for collage-making, arranging pebbles to match given patterns, and exploring different textures using natural objects. These hands-on activities were deliberately chosen to provide sensory input and opportunities for repeated practice, both of which are essential for strengthening fine motor coordination. The teaching approach emphasized play-based and child-centered learning, which not only engaged children's interest but also encouraged autonomy and self-expression. The use of natural materials such as stones, leaves, wood, seeds, and bamboo provides an effective and affordable way to promote both motor and cognitive development in early childhood. This approach was clearly reflected in the learning environment and instructional strategies at TK Anugerah.

In terms of teaching methodology, educators integrated fine motor development into daily routines and thematic projects. For example, children created masks using scissors and glue during a theme on animals, folded paper to make boats during a transportation unit, and used fingers to trace letters in sand during pre-writing exercises. These activities were not only fun and interactive but also embedded fine motor training into meaningful contexts [32], [33]. Moreover, teachers encouraged children to participate in self-help routines such as organizing their belongings, zipping bags, and buttoning clothes, all of which supported the development of functional fine motor skills [34], [35].

Several factors were found to influence the progress of fine motor development among the children. One such factor was individual variation. Teachers noted that each child followed a unique developmental trajectory, and progress depended on multiple aspects, including prior exposure, home environment, and innate ability. Children who regularly engaged in drawing or crafts at home tended to show better fine motor control. In contrast, children with limited exposure to fine motor tasks outside school often required more intensive support in the classroom. This finding underscores the critical role of parental involvement and home-based learning in reinforcing school-based interventions.

Health and nutrition were also highlighted as important factors [36], [37], [38], [39]. Teachers observed that children who had a balanced diet and good physical health were more energetic and focused during motor activities, whereas those who were frequently unwell or undernourished showed signs of fatigue and weak muscle tone. These observations align with developmental research suggesting that physical growth and brain development are closely interconnected and that adequate nutrition supports motor skill acquisition.

The role of educators was central to the success of fine motor interventions. Teachers at TK Anugerah demonstrated adaptability and creativity in designing learning experiences that suited the needs of individual students. They provided scaffolding—temporary support tailored to each child's ability level—and gradually reduced assistance as competence increased. This method reflects Vygotsky's theory of the Zone of Proximal Development, which emphasizes the importance of guided learning in helping children perform tasks slightly beyond their independent capabilities [40]. Teachers also utilized peer learning by pairing children of different ability levels to work on projects together. This encouraged cooperation and allowed less advanced learners to observe and model the behaviors of their peers.

Despite the many successes, several challenges were encountered in the implementation of fine motor development strategies. One significant challenge was the large class size relative to the number of teachers. With limited staff, it was difficult to provide individual attention and early intervention for children with developmental delays. In some cases, this resulted in uneven progress among students. Another issue was the scarcity of educational tools and resources. Although teachers made commendable use of natural and recycled materials, they expressed a need for more structured learning media such as puzzles, pegboards, lacing cards, and adaptive scissors to enhance activity variety and effectiveness. Time constraints also posed a problem, as teachers had to balance fine motor development with other curriculum areas, including cognitive and social-emotional domains [23], [41]. Additionally, some parental expectations leaned heavily toward early reading and writing, placing pressure on teachers to focus more on academic outcomes rather than foundational motor readiness.

The findings of this study are consistent with the broader literature on early childhood development, which stresses that fine motor skill development should be a key focus in early learning settings. Piaget's cognitive development theory supports this, asserting that children learn best through hands-on experiences and physical interaction with their environment. In Piaget's view, manipulation of objects not only develops motor coordination but also stimulates the construction of knowledge. This theoretical perspective was clearly embodied in the classroom practices observed at TK Anugerah, where tactile, exploratory, and creative tasks formed the core of fine motor instruction.

From a developmental perspective, fine motor skills serve as a bridge between physical growth and cognitive function. Research suggests that improved fine motor control is linked to better performance in mathematics, language, and executive functioning. This is because many school-related tasks—such as writing numbers, forming letters, or manipulating small learning tools—require fine motor precision. Furthermore, children who feel capable in managing these tasks tend to be more confident, motivated, and independent learners. Thus, the significance of fine motor development extends beyond physical coordination; it is also deeply connected to children's sense of competence and emotional well-being.

Implications

The findings of this study imply that fine motor development should be a central focus in early childhood education, as it directly affects children's academic readiness, independence, and self-confidence. Teachers play a critical role in designing engaging, hands-on activities using accessible materials to support children's motor coordination. The study also highlights the importance of teacher training in early identification of developmental delays and the need for differentiated instruction. Furthermore, parental involvement is essential, as home-based activities significantly influence children's progress. At the policy level, addressing challenges such as large class sizes and limited resources is crucial. Adequate funding for fine motor learning tools and support for inclusive teaching practices are necessary to ensure that every child receives developmentally appropriate stimulation during these formative years.

Research Contribution

This study contributes to the growing body of knowledge on early childhood education by emphasizing the significance of fine motor development as a foundation for school readiness and independent functioning. By documenting practical, low-cost strategies used by teachers at TK Anugerah—particularly the use of natural materials such as sand, clay, and stones—this research offers contextually relevant insights for early childhood educators in low-resource settings. It also demonstrates how play-based and multisensory activities can be integrated into daily learning routines to foster fine motor growth. Furthermore, the study highlights the role of teachers' creativity, observation skills, and instructional flexibility in addressing developmental differences among children. It provides a reference for future program development that seeks to balance academic instruction with motor skill enhancement in early childhood education.

Limitations

Despite its valuable findings, this study has several limitations. First, the research was conducted in a single institution—TK Anugerah—which may limit the generalizability of the results to other educational contexts with different demographic or institutional characteristics. Second, the qualitative nature of the study means that data were interpreted based on observations and teacher interviews, which may include subjective bias. Third, the study focused exclusively on fine motor development, without integrating assessment of how these skills directly relate to academic performance or other developmental domains such as cognitive or emotional growth. Additionally, the limited timeframe of data collection prevented the study from capturing longitudinal changes in children's motor skill progression.

Suggestions

Future research should involve multiple early childhood institutions across diverse geographic and socio-economic contexts to enhance the generalizability of findings. Longitudinal studies are recommended to track fine motor development over time and to assess its long-term impact on academic and social outcomes. Quantitative methods, including standardized motor skill assessments, could complement qualitative approaches to provide a more comprehensive understanding of children's development. In practice, schools are encouraged to invest in ongoing professional development for teachers, particularly in designing motor skill–enhancing activities using available resources. Collaboration between parents and schools should be strengthened to ensure continuity of motor stimulation at home. Lastly, policymakers should consider allocating budget support for educational media and materials that stimulate fine motor development, especially in under-resourced areas, as part of broader efforts to improve early childhood learning outcomes.

CONCLUSION

Based on the research findings and discussion, it can be concluded that teachers play a pivotal role in facilitating fine motor development in early childhood at TK Anugerah. Fine motor skills—comprising small muscle movements that require precise hand-eye coordination—are essential for both academic and everyday tasks. The study highlights that each child develops at their own pace; while some children show rapid progress, others, including those with developmental delays or disabilities, require additional support and encouragement. The research revealed that teachers at TK Anugerah employ a variety of strategies to stimulate fine motor skills, including activities such as paper crumpling, working with natural materials (e.g., sand and stones), and collage-making. These activities not only enhance children's motor coordination but also engage them in creative, tactile exploration. Collage-making, in particular, was found to be effective in helping children recognize and manipulate different textures, shapes, and sizes. Furthermore, the study identified that fine motor development is influenced by a combination of intrinsic factors such as genetics and extrinsic factors such as environmental stimulation and teacher support. Delays in fine motor skills can affect a child's self-confidence and readiness for formal schooling, underscoring the importance of early and responsive intervention. Overall, the study reinforces the need for intentional, engaging, and developmentally appropriate practices to support children's holistic growth during the early years.

AUTHOR CONTRIBUTION STATEMENT

IUFAM conceptualized the study, led the research design, supervised the data collection process, and finalized the manuscript. MA Jariyah contributed to the literature review, assisted in data collection, and participated in the initial drafting of the manuscript. DS conducted the primary data analysis, contributed to data interpretation, and critically reviewed the manuscript for important intellectual content. SAR supported the preparation of research instruments,

organized classroom observations, and helped refine the discussion and findings. DRJ contributed to the interview process, transcribed data, and participated in editing and proofreading the final manuscript. All authors have read and approved the final version of the manuscript.

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