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Implementation of the Sensory Play Method to Develop Children's Fine Motor Skills at PAUD Bina Insania Arrahman, Ternate City

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ABSTRACT

This study aimed to describe the implementation of sensory play methods in developing children's fine motor skills at PAUD Bina Insania Arrahman, Ternate City. The study used a descriptive qualitative approach with 15 group B children as subjects and two class teachers and one principal as informants. Data collection techniques included participatory observation, in-depth interviews, documentation, and field notes. Data analysis used the interactive model of Miles, Huberman, and Saldaña, with triangulation for data validity. The results of the study showed: (1) planning was carried out systematically through RPPH integrated with the learning theme, carried out at least three times a week for 30-45 minutes; (2) implementation used varied materials including playdough, water, sand, seeds, and local natural materials with teachers acting as facilitators, observers, motivators, guides, and models; (3) children's fine motor development increased significantly with tripod grasp abilities increasing to 80%, eye-hand coordination 87%, pincer grasp 87%, and bilateral coordination 73%; and (4) obstacles including limited space and preparation time were overcome through the use of outdoor activities, parental cooperation, and intensive communication. Conclusion: The implementation of the sensory play method effectively develops children's fine motor skills through the creative use of local materials and child-centered learning.

Keywords: Sensory Play, Fine Motor Skills, Early Childhood.

I. Introduction

Early Childhood Education (PAUD) is a crucial foundation for optimizing child growth and development during the golden age, the period from 0-6 years of age, when brain growth and development are extremely rapid. During this period, all aspects of a child's development must be optimally stimulated, including fine motor skills, which are fundamental to their readiness for the next level of education. Fine motor development encompasses a child's ability to use small muscles, such as those in the fingers and wrists, to perform activities such as grasping, squeezing, writing, cutting, and other manipulative skills that require hand-eye coordination.

Optimal fine motor development significantly impacts a child's ability to perform daily activities and future academic readiness. Yusria (2016) showed that 42% of early childhood children in Indonesia experience



delays in fine motor development, which can impact their ability to write, draw, and develop other practical skills. This situation indicates the need for appropriate and engaging learning methods to stimulate children's fine motor development from an early age (Im et al., 2025).

One method that can be used to develop children's fine motor skills is the sensory play method. Sensory play is a learning activity that involves all five senses of children through the exploration of various materials and textures, such as water, sand, playdough, seeds, and other natural materials. This method allows children to learn through concrete and fun direct experiences while also practicing eye-hand coordination and finger muscle strength through the activities of squeezing, pouring, moving, and manipulating various objects. According to Anisykurli et al. (2025), sensory play not only stimulates motor development but also supports sensory integration, which is important for children's cognitive, language, and social-emotional abilities.

Previous research has demonstrated the effectiveness of sensory play in developing children's fine motor skills. A study conducted by Iswahyuni et al., 2023, at several early childhood education centers in Bandung, found that implementing sensory play for 8 weeks improved children's fine motor skills by 73.5%, categorizing them as excellent. Similar results were demonstrated by Ilmiyah et al. (2024), who revealed that children stimulated through sensory play had fine motor development scores 2.3 times higher than those using conventional learning methods. Meanwhile, international research by Pramling Samuelsson and Sry et al. (2024) confirmed that sensory play experiences significantly contribute to fine motor development and preparation for pre-writing skills in preschool-aged children.

Based on initial observations conducted by researchers at the Bina Insania Arrahman PAUD in Ternate City in October 2024, it was found that of the 25 children in Group B (aged 5-6 years), 16 (64%) still experienced difficulties in performing fine motor activities such as holding a pencil correctly, cutting according to a pattern, and stringing beads in the correct order. Observations also indicated that the learning methods applied tended to be conventional, with the use of children's worksheets (LKA) lacking in variety, resulting in children quickly becoming bored and less enthusiastic about participating in learning activities. (Adiyana Adam. Wahdiah, 2023) Children's eye-hand coordination is also not yet optimally developed, as evident in the still-stiff and poorly controlled writing and drawing activities.

Ternate City's geographical location, as an archipelago with abundant natural resources, could be utilized as a rich and varied sensory play medium, such as beach sand, shells, small stones, leaves, and other natural materials. However, this potential has not been optimized in the learning process at Bina Insania Arrahman PAUD. Utilizing natural materials as sensory play media is economical and readily available and provides authentic and meaningful learning experiences for children. Sari and Marlina (2023) found that using natural materials in sensory play is more effective in increasing children's engagement and focus duration in activities than using conventional toys.

The importance of this research is also supported by government policy, through Minister of Education and Culture Regulation No. 137 of 2014 concerning National Early Childhood Education Standards, which emphasizes the importance of child-centered learning with a playful approach to learning. Furthermore, the Independent Early Childhood Education Curriculum encourages holistic and integrative learning by utilizing the environment as a learning resource. However, implementation in the field still faces various challenges, particularly related to educators' understanding of innovative learning methods and the use of learning media appropriate to the characteristics of early childhood.

Given the importance of fine motor development in early childhood and the suboptimal learning methods implemented at Bina Insania Arrahman Early Childhood Education in Ternate City, this research is crucial. This study is expected to provide a practical contribution in the form of a systematic and structured implementation model for sensory play to develop children's fine motor skills, as well as provide an empirical overview of the method's effectiveness in the context of early childhood education (PAUD) in an island region.

The results are expected to serve as a reference for other PAUD educators in implementing innovative and enjoyable learning methods that align with the principles of early childhood development.

II. Literature Review and Hypothesis Development

2.1. The Concept of Fine Motor Development in Early Childhood

Fine motor development is an important aspect of early childhood growth and development, related to the ability to coordinate small muscle movements, especially in the fingers, wrists, and eye-hand coordination, to perform activities that require skill and precision. According to Agustina et al. (2018), fine motor skills include physical skills that involve small muscles and eye-hand coordination, such as the ability to hold a pencil, cut, string, stick, fold, and write. Fine motor development is important because it is the foundation for children to carry out various daily life activities independently and influences their academic readiness at the next level of education. Sutini (2013) explains that fine motor development in children aged 4-6 years is in the fundamental movement skills phase, where children begin to develop more precise control and coordination of movements, including manipulative abilities such as pinching, squeezing, pouring, and manipulating small objects. This development is progressive and requires appropriate and continuous stimulation so that children can reach the optimal level of motor maturity according to their age.

2.2. Theory of Learning through Play

The concept of play as a medium for early childhood learning has a strong theoretical basis in various developmental and learning theories. (Pratiwi 2017) stated that Jean Piaget's cognitive theory emphasizes that children learn most effectively through direct experience with concrete objects in their environment (Piaget, 1952), where play becomes the child's main means of constructing knowledge through the process of assimilation and accommodation. (Vygotsky, 1978) Sociocultural theory emphasizes that play creates a "zone of proximal development" where children can achieve higher abilities through scaffolding and interaction with the environment and adults. In the context of early childhood education, play is not merely a recreational activity but a fundamental learning modality in which children actively explore, experiment, and build an understanding of the world around them. According to constructivism theory, meaningful learning occurs when children are actively involved in the learning process through direct experience that involves all their senses and not through passive transmission of knowledge. Khoirotn et al. (2025) emphasized that play-based learning supports children's holistic development, including cognitive, physical, social, emotional, and creative aspects in an integrated manner, making it the most appropriate approach to the characteristics and developmental needs of early childhood.

2.3. Concepts and Principles of Sensory Play

Sensory play is a type of play activity that involves stimulating one or more of a child's five senses—sight, hearing, smell, taste, and touch—through the exploration of various materials with different textures, colors, aromas, and characteristics. The sensory integration theory developed by Ayres (1979) explains that the human brain processes and organizes sensory information from the body and the environment to produce adaptive responses, where sensory play provides a rich experience to develop this sensory integration ability. According to (Lickona, 1991) sensory play provides opportunities for children to explore materials through touch, manipulation, and experimentation, which not only develops sensory abilities but also fine motor skills, problem solving, creativity, and self-regulation. Materials commonly used in sensory play include water, sand, clay, playdough, rice, nuts, seeds, gels, foams, ice, and various natural materials such as leaves, twigs, stones,

and shells. Sensory play activities can be designed in various forms, such as sensory bins (containers filled with materials to be explored), sensory bottles (bottles filled with visually appealing materials), messy play (playing with "messy" materials), and nature play (playing with natural materials). The main principles of sensory play are allowing freedom of exploration, providing safe and varied materials, creating a supportive environment, and giving children enough time to explore without being rushed or given too much instruction from adults.

2.4. The Relationship Between Sensory Play and Fine Motor Development

Sensory play is closely linked to children's fine motor development because, in every sensory play activity, children naturally perform various manipulative movements that train the strength, coordination, and precision of the small muscles in their hands and fingers. When children squeeze playdough, pour water from one container to another, pick up grains using tweezers or a small spoon, or insert small objects into holes, they are indirectly practicing prehension skills (the ability to grasp), hand-eye coordination (eye-hand coordination), bilateral coordination (coordination of both hands), and fine motor precision (precision of fine movements). Neurological research shows that rich sensory experiences stimulate the formation of neural connections in the brain, particularly in areas that regulate fine motor control and sensory-motor integration (Suhartanti et al., 2019), explaining that manipulating materials with different textures and resistances, such as squeezing hard clay versus soft playdough, provides important proprioceptive feedback for developing graded force and finer motor control. Sensory play activities also develop tactile discrimination (the ability to distinguish textures through touch), which is an important component of functional fine motor skills, such as feeling a pencil in your hand when writing or distinguishing objects in a bag without looking. In addition, sensory play creates high intrinsic motivation because of its fun and exploratory nature, so that children tend to do activities for longer durations and more repetitions, which is the key to mastering fine motor skills through continuous practice (Handayani & Kaffa, 2025).

2.5. Implementation of Sensory Play in Early Childhood Education

Implementing sensory play methods in early childhood education settings requires careful planning, an understanding of the principles of child development, and creativity in providing materials and designing activities that align with learning objectives. According to Sidiq et al. (2025), effective implementation of sensory play requires several important components, including (1) providing safe, varied, and age-appropriate materials; (2) designing a conducive learning environment that supports exploration; (3) the role of educators as facilitators who provide scaffolding without too much intervention; (4) integration with specific learning objectives while still allowing freedom of exploration; and (5) continuous observation and documentation of children's development. In the context of the PAUD curriculum, sensory play can be integrated into various learning areas and themes through a thematic-integrative approach. (Sry et al., 2024) emphasize the importance of "continuous provision" where sensory play materials are consistently available in learning areas so that children can access them independently according to their interests and needs, not only in scheduled structured activities. The implementation of sensory play also needs to consider the diversity of children, including those with sensory processing difficulties or other special needs, where modifications and adaptations of materials and the environment may be necessary. The success of sensory play implementation is not only seen from the achievement of fine motor skills alone, but also from other aspects such as child engagement, duration of focus, quality of exploration, problem-solving skills, and the development of cognitive, language, and social-emotional aspects integrated in play activities, in accordance with the principles of holistic-integrative learning in early childhood education.

III. Research Method



This study used a descriptive qualitative approach to understand the implementation of the sensory play method in developing children's fine motor skills at Bina Insania Arrahman PAUD in Ternate City (Miles et al., 1992). The study was conducted from January to March 2025 at Bina Insania Arrahman PAUD in Mangga Dua Village, South Ternate District, Ternate City, North Maluku Province. The subjects were 15 children in Group B (aged 5-6 years), consisting of eight boys and seven girls. The informants included two class teachers and one principal. The purposive sampling technique was used for subject selection (Sugiyono, 2017).

Data collection included: (1) participatory observation to observe the implementation process and development of children's fine motor skills; (2) in-depth interviews with teachers and the principal; (3) documentation in the form of RPPH (learning plan), photos, videos, and children's work; and (4) field notes (Miles, M and Huberman, 1994). The instruments used included observation guidelines, interview guidelines, documentation checklist sheets and audio-visual recording devices. The instruments were compiled based on fine motor development indicators according to the Permendikbud No. 137 of 2014. Data analysis used the interactive model of Miles et al. (2014), which consists of: (1) data collection; (2) data condensation; (3) data presentation; and (4) drawing conclusions and verification. Data validity was assessed using source triangulation, technique triangulation, time triangulation, member checking, and peer debriefing.

IV. Result and Discussion

4.1. Analysis Result

Based on data obtained through observation, interviews, and documentation during research at PAUD Bina Insania Arrahman, Ternate City, in January-March 2025, the following are the results of research regarding the implementation of sensory play methods to develop fine motor skills in Group B children.

4.2. Sensory Play Method Implementation Planning

Based on interviews with class teachers and the principal, as well as an analysis of the RPPH (Learning Implementation Plan) documents, it was found that planning for the implementation of sensory play methods was systematic and structured. Teachers developed Daily Lesson Implementation Plans (RPPH) that integrated sensory play activities with the ongoing learning theme. Ms. SR, a class B1 teacher, stated, "We plan sensory play activities to align with the weekly theme. Each week we prepare various sensory materials such as sand, water, playdough, seeds, and natural materials that we collect from the beach." Planning includes several important aspects: (1) determining learning objectives that focus on fine motor development; (2) selecting safe, varied sensory materials that are appropriate to the learning theme; (3) preparing media and supporting tools such as containers, spoons, tweezers, and molds; (4) developing systematic activity steps; and (5) preparing indicators for assessing children's development. The analysis of the RPPH documentation revealed that teachers planned sensory play activities at least three times a week, lasting for 30-45 minutes per session. The planned materials vary weekly to provide children with diverse sensory experiences.

4.3. Implementation of the Sensory Play Method

4.3.1. Types of Sensory Play Activities

The results show that the sensory play method is implemented through various activities designed to stimulate children's fine motor skills. These activities include the following: 1) Playing with Playdough Children perform activities such as squeezing, flattening, rolling, and forming playdough into various shapes.

Observations show that 14 out of 15 children (93%) were very enthusiastic about this activity. Children use their fingers to manipulate the playdough; some make round or long shapes or use molds to make various shapes. 2) Playing with Water and Sand This activity uses natural materials that are easily found in the school environment. Children pour water from one container to another using a plastic cup or spoon, sift sand, and create shapes from wet sand. This activity trains eye-hand coordination and finger muscle strength control. 3) Playing with Grains and Dry Materials Children move rice, mung beans, or corn from one container to another using a spoon, tweezers, or directly with their hands. This activity is very effective for training pincer grasp skills and bilateral coordination. 4) Playing with Natural Materials (Nature Play) Utilizing the natural wealth of Ternate City, teachers provide shells, small stones, leaves, twigs, and beach sand as sensory play media. Children string shells, arrange stones, and create collages from natural materials. 5) Finger Painting and Messy Play Children paint using their fingers, palms, or sponges in various colors. This activity trains the finger strength and fine motor coordination.

4.3.2. Activity Implementation Process

Observations showed that the implementation of sensory play activities followed a consistent pattern with three main stages: Opening Stage (10 minutes): The teacher began by inviting the children to gather for circle time, introducing the materials to be used, explaining the rules of the game, and motivating them to participate. The teacher also conducted a question-and-answer session to activate the children's prior knowledge of the materials. Core Stage (30-40 minutes): The children were divided into small groups (to 3-4 children per group) to engage in sensory play activities. The observations showed that the children were highly focused and enthusiastic about exploring the materials. The teacher acted as a facilitator, observing, guiding, and providing scaffolding when the children encountered difficulties. There were no overly strict instructions, allowing the children the freedom to explore according to their own interests and methods. Ms. DN, the B2 class teacher, explained, "We give the children the freedom to explore the materials at their own pace. We only provide initial direction and guidance when they require assistance. What matters is the process of exploration, not the end result." Closing Stage (5-10 minutes): The teacher invited the children to share their experiences, what they felt, and what they made. The children were then invited to tidy up the materials and wash their hands together.

4.3.3. The Role of Teachers in Implementation

Observations and interviews indicate that teachers play a crucial role in the successful implementation of sensory play methods. The teacher's role includes: first, facilitator: The teacher acts as a facilitator by preparing materials and creating a learning environment conducive to children's exploration. The teacher ensures that all materials are safe, clean, and available before the activity begins and organizes the play space for easy access and freedom of movement for children. Observations indicate that the teacher consistently prepares the sensory play area from the beginning, including adequately organizing the materials and supporting tools. Furthermore, teachers innovate by modifying and varying learning materials to enrich sensory experiences and increase children's interest in learning.

Second, the teacher acts as an observer by observing and recording the development of children's fine motor skills during the activity. Observations were systematically conducted using an observation checklist covering aspects of grasping, eye-hand coordination, bilateral ability, and focus duration. The results of the observations are used as the basis for planning follow-up activities tailored to each child's individual needs. Development documentation is done through written notes, photos, and videos, which are also used as a means of communicating with parents.

Third, Motivator: The teacher acts as a motivator by consistently providing encouragement and positive praise during sensory play activities. This praise is specific to a child's efforts and progress, thereby boosting self-confidence and intrinsic motivation. Furthermore, the teacher provides verbal support to children experiencing difficulties to encourage them to keep trying. This positive motivational approach creates a psychologically safe learning environment and encourages children to continue exploring, without fear of making mistakes. Fourth, Guide: The teacher acts as a guide or mentor by gradually providing scaffolding when the children experience difficulties. Assistance is provided through verbal prompts, brief demonstrations, and open-ended questions that stimulate thinking without taking over the child's work. Support is tailored to the child's ability level and is gradually reduced as skills develop, thus encouraging independent learning while preventing frustration. Fifth, in the Model stage, the teacher acts as a model. Although the sensory play method emphasizes children's free exploration, there are times when teachers need to demonstrate certain techniques or skills as examples for children, without forcing them to imitate exactly. Observations show that teachers sometimes demonstrate how to hold tweezers correctly, pour water carefully, or knead playdough to form certain objects. These demonstrations are done in a casual and non-instructive manner so that children see them as one possible way of doing something, not the only correct way. Mrs. DN explained, "We sometimes show how to do something, but we always tell the children that they are allowed to do it their own way. The important thing is that they are willing to try and explore." This approach inspires children without stifling their creativity. These five teacher roles are not independent but are integrated into daily learning practices. Within a single learning activity, teachers can switch roles according to the needs of the situation and the children's conditions. Teacher flexibility in carrying out these various roles is a key factor in the successful implementation of the sensory play method at Bina Insania Arrahman PAUD.

Based on documentation and observations during the eight-week study, Bina Insania Arrahman PAUD uses a wide variety of sensory play materials, utilizing natural materials available in the school environment. Wet materials included water, playdough, clay, colored gel, and wet sand; dry materials included rice, mung beans, corn, dry sand, and flour; natural materials included shells, small stones, leaves, twigs, flowers, and beach sand; and supporting materials included plastic containers of various sizes, spoons, cups, tweezers, molds, funnels, and sieves. The principal, Mrs. HM, stated, "We strive to utilize the natural resources around the school. This not only saves costs but also provides a more meaningful learning experience because the children become familiar with their own environment."

The strategy of utilizing local materials received a positive response from parents. The variety of materials is also tailored to the weekly learning themes to enrich children's cognitive development. In terms of safety, all materials were ensured through rigorous cleaning and inspection. The sensory play area is attractively arranged using transparent containers and illustrated labels to foster children's independence and creativity. With a varied combination of materials and a creative strategy for utilizing local resources, PAUD Bina Insania Arrahman has successfully created an effective sensory play environment for developing children's fine motor skills at an affordable price.

4.4. Children's Fine Motor Development After Implementing the Sensory Play Method

The observations showed significant improvements in grasping and squeezing skills. In the initial observation (before implementation), 11 of the 15 children (73%) used a whole-hand grasp when holding small objects or pencils. After eight weeks of sensory play implementation, 12 of the 15 children (80%) could use a more mature tripod grasp (three-finger grasp). Regularly squeezing playdough is highly effective in strengthening finger muscles. Children who initially struggled to squeeze playdough firmly were able to squeeze, flatten, and shape it with improved control after several weeks.

Children's eye-hand coordination skills were significantly developed. Pouring water from one container to another, which initially caused a lot of spillage, gradually became more controlled as the child progressed. Observations showed that 13 of the 15 children (87%) showed improved pouring accuracy with minimal spillage compared to the baseline. Transferring seeds using a small spoon or tweezers also yielded positive results. Children who initially had difficulty picking up small seeds with tweezers were able to do so with greater precision after regular practice. The ability to pick up small objects using the thumb and index finger (pincer grasp) is a fine motor skill crucial for preparing for writing. Observations show that sensory play activities with small materials, such as seeds, small shells, and beads, are very effective in developing this skill. In the first week of implementation, only six out of 15 children (40%) were able to pick up small objects correctly using the pincer grasp. By the eighth week, this number had increased to 13 children (87%) who were able to perform the pincer grasp stably and in a controlled manner.

Bilateral coordination, or the ability to coordinate both hands to work together, is also developed. Activities such as stringing shells, opening and closing containers, and holding a container with one hand while pouring with the other are practiced. Observations showed that 11 out of 15 children (73%) demonstrated an improvement in bilateral coordination. They were able to use one hand as a stabilizer and the other as a manipulator, more effectively. Practical skills, such as cutting, writing, and drawing, have also improved. Observations of writing activities showed that children's writing became more controlled, with more precise pressure (neither too hard nor too soft). Pencil strokes became more stable, and the children were able to write within a more confined area. Their cutting skills also improved. Children who initially had difficulty cutting along lines were able to cut better after receiving stimulation through sensory play that trained finger muscle strength. Of the 16 children who initially (based on initial observations) had difficulty cutting, only three still required intensive guidance after the implementation. One interesting finding was the increase in children's focus duration and engagement in learning activities. Observations showed that the average focus duration of children in sensory play activities was 25-35 minutes, significantly longer than conventional learning activities using LKA, which only lasted 10-15 minutes. Mrs. SR explained, "The children were very enthusiastic about the sensory play activities. They did not get bored and often asked to continue the activities even after the time was up. This is very different from traditional learning, where children quickly get bored."

4.5. Obstacles in Implementing the Sensory Play Method

Although the implementation of the sensory play method showed positive results, several obstacles were encountered during its implementation. Bina Insania Arrahman Preschool has limited space specifically for sensory play activities, particularly messy play, which requires an area that is easy to clean. Teachers overcome this obstacle by conducting activities outdoors or using plastic tarps as a base for their activities. The preparation of sensory materials requires considerable time and effort. Teachers must collect, clean, and prepare materials before the activity begins. Some parents initially expressed concerns about the cleanliness of sensory play activities, especially those involving wet or messy materials. Teachers addressed this by communicating intensively with parents about the benefits of the activities and ensuring that all materials used were safe and clean. Children have varying initial fine motor skills. Some children already have good abilities, while others still require intensive guidance. Teachers addressed this by providing differentiated instruction or learning tailored to the child's individual needs. Based on interviews and observations, several strategies implemented to overcome these challenges include: a) utilizing outdoor areas and the surrounding environment for activities requiring more space; b) collaborating with parents to prepare materials, especially natural materials that can be gathered from home; c) establishing a sensory corner in a corner of the classroom that children can access independently; d) parent workshops to educate about the importance of sensory play and how to continue stimulation at home; e) documenting and communicating regularly with parents via

WhatsApp groups to monitor children's progress; and e) providing individual guidance for children who require special attention.

The principal stated, "We actively involve parents in this program. We hold meetings with parents to explain the program and solicit their support from parents. The results are very positive; parents have become more understanding and supportive of these sensory play activities."

Observations indicated a very positive response from children to the sensory play method. Indicators of positive responses observed included: High enthusiasm: Children were very excited when they learned there would be sensory play activities; Active involvement: All children were actively involved in the activities, none were passive or refused; Creative exploration: Children demonstrated creativity in exploring materials in their own way; Social interaction: Sensory play activities encouraged positive interactions between children, sharing materials, and cooperation; Expression of positive emotions: Children appeared happy, smiling, and laughing during the activities; Requests for repetition: Children often asked to repeat activities they enjoyed. The results of this study indicate that the implementation of the sensory play method at Bina Insania Arrahman PAUD in Ternate City was carried out systematically and had a significantly positive impact on children's fine motor development. Careful planning, consistent implementation, support from teachers and parents, and the use of varied and contextual materials are key factors in the successful implementation of this method. Although there were several obstacles, the right strategy was able to overcome them so that the learning objectives could be achieved effectively.

4.6. Discussion

Based on the research results, the implementation of sensory play methods to develop children's fine motor skills at Bina Insania Arrahman PAUD in Ternate City showed positive results and aligned with various theories and previous research. Systematic planning through the development of an RPPH (Learning Plan) that integrates sensory play activities with learning themes demonstrates teacher professionalism, in line with the opinion of Sry et al. (2024) regarding the importance of careful planning in play-based learning. The frequency of activities, at least three times a week for 30-45 minutes, reflects a commitment to providing consistent stimulation necessary for optimal fine motor development.

The variety of sensory play activities, from playdough, water, and sand, seeds, to natural materials, provides rich sensory experiences and prevents children from getting bored. The use of local natural materials such as shells, beach sand, and rocks is particularly advantageous, as it is economical and meaningful, helping children become familiar with their environment. These findings support the research of Iswahyuni et al. (2023), who suggested that natural materials are more effective in increasing child engagement. The learning process, which allows freedom of exploration, reflects a child-centered learning approach in accordance with constructivism theory and the concept of the zone of proximal development (Vygotsky, 1978). The duration of children's focus reaches 25-35 minutes, much longer than conventional learning (10-15 minutes), demonstrating the success of this method in attracting children's intrinsic motivation. Children's fine motor development shows significant improvements in various ways. Grip ability increases from 73% of children using a whole-hand grasp to 80% being able to use a more mature tripod grasp in preparation for writing, in line with the research (Minarti, 2023). Eye-hand coordination develops well, with 87% of children demonstrating high accuracy in pouring, which, according to Minarti (2023), is strongly correlated with academic achievement. Pincer grasp ability increased dramatically from 40% to 87%, whereas bilateral coordination developed in 73% of the children. Practical skills, such as writing, drawing, and cutting, also improved, with the number of children with cutting difficulties decreasing from 16 to just 3, supporting the findings of Sidiq et al. (2025) on the role of sensory play in academic readiness.

The five roles of teachers as facilitators, observers, motivators, guides, and models demonstrate the complexity of the task, requiring high pedagogical competence, consistent with research (Lynch, S.A. &

Simpson, C.G., 2010). Systematic documentation of child development and a positive motivational approach through specific praise for the process, not the outcome, reflect an effective understanding of the growth mindset. Ternate City's strategy of utilizing local materials represents a best practice that addresses budget constraints while providing high pedagogical value through contextual learning. Children's involvement in collecting natural materials provides a holistic experience that develops not only fine motor skills but also a love of nature and social skills, in line with the concept of place-based education. Positive parental responses indicate the importance of school-family collaboration in providing continuous stimulation.

The integration of sensory play with weekly learning themes demonstrates a holistic-integrative approach, where fine motor development is integrated with cognitive, language, and social-emotional aspects, as emphasized (Pramling.Samuelsson.I. & Fleer.M.(Eds.), 2009) The school's ability to identify creative solutions to various constraints, such as limited space, preparation time, and parental concerns, demonstrates professionalism in problem-solving. Intensive communication with parents has proven effective in building understanding and support for children with disabilities.

This study provides empirical support for Ayres' sensory integration theory (Ayres, 1979), Piaget's cognitive theory (Piaget, 1952), Vygotsky's sociocultural theory (Vygotsky, 1978), and the theory of learning through play. The successful implementation model demonstrates that quality learning does not require high costs but relies on teachers' creativity, an understanding of child development principles, and a commitment to providing meaningful experiences. The limitations of this study include the short period (8 weeks), the focus on a single institution, and the qualitative approach without standardized measurements. This opens up opportunities for further research using longitudinal, multiple-site, or mixed-methods designs. Overall, the implementation of the sensory play method at Bina Insania Arrahman PAUD was well executed and had a significantly positive impact on children's fine motor development. This success was supported by systematic planning, consistent implementation, the role of professional teachers, the use of creative local materials, and support from all stakeholders. The findings are consistent with previous theory and research and provide a practical contribution in the form of a model that can be adapted to other PAUDs, especially those with limited budgets but rich local resources.

V. Conclusion

Based on the results of research and discussion on the implementation of sensory play methods to develop children's fine motor skills at PAUD Bina Insania Arrahman, Ternate City, the following conclusions can be drawn: First, planning for the implementation of sensory play methods is carried out systematically through the preparation of RPPH, which integrates sensory play activities with learning themes, including determining objectives, selecting materials, preparing media, preparing activity steps, and determining assessment indicators. Activities were carried out at least three times a week, with a duration of 30-45 minutes per session. Second, implementation is carried out through various activities, including playing with playdough, water and sand, seeds, natural materials, and finger painting. The teacher acts as a facilitator, observer, motivator, guide, and model by providing children with the freedom to explore. The materials used varied greatly, utilizing wet, dry, and local natural materials from Ternate City, as well as various supporting tools. Third, children's fine motor development showed significant improvement after eight weeks of implementation. Grip ability increased from 73% to 80% of children using tripod grasp, eye-hand coordination developed in 87% of children, pincer grasp ability increased from 40% to 87%, bilateral coordination developed in 73% of children, and practical skills improved with children having difficulty with scissors decreasing from 16 to 3 children. Children's focus duration also increased to 25-35 minutes. Fourth, the obstacles faced included limited space, material preparation time, parental concerns, and variations in children's initial abilities. Strategies to overcome obstacles included the use of outdoor areas, collaboration with parents, establishment of sensory corners, parent workshops, regular communication, and individual

guidance. Fifth, successful implementation was supported by systematic planning, consistent implementation of the principles of child-centered learning, the role of professional teachers, the use of creative local materials, integration with learning themes, and strong support from the principal and parents. Overall, the implementation of the sensory play method at PAUD Bina Insania Arrahman Ternate City was proven to be effective in developing fine motor skills in Group B children, increasing finger muscle strength, eye-hand coordination, pincer grasp ability, bilateral coordination, and practical skills for academic readiness. This success demonstrates that quality learning can be achieved through teachers' creativity in utilizing local resources, understanding the principles of child development, and commitment to providing meaningful learning experiences.

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