

The Effectiveness of Using Multisensory Learning Style toward the Improvement of Preschool Student's Fine Motor Skills

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Abstract

Fine motor skills are crucial for children's development, as they impact various aspects of their daily lives, including academic success, social interaction, and independence. Multisensory learning style, which involves using multiple senses during the learning process, has shown promising results in enhancing the development of fine motor skills in preschool students. This research aims to investigate the effectiveness of using multisensory learning style toward the improvement of preschool students' fine motor skills. The research will use a qualitative research design semi-structured interview and observation. This study focuses on famous Islamic kindergarten in city where participants are educators at the first preschool student's consisting of eight Sensory learning teachers. Three participants (teachers) have been identified and the results of this study will provide insights into the effectiveness of multisensory learning style in enhancing preschool students' fine motor skills, and its potential impact on their overall development. The research findings will also contribute to the development of educational programs and teaching methods that can optimize the learning and development of young children. Future research should focus on evaluating the effectiveness of multisensory approaches in improving children's achievements in various domains.

Keywords

Multisensory Learning Style, Fine Motor Skills, Preschool Students, Sensory Integration and Teaching Methods

1. Introduction

Based on Malaysia National Philosophy of Education (NPE)'s act (Ministry of Education, 2008):

“Education in Malaysia is an on-going effort towards further developing the potential of individuals in a holistic and integrated manner, so as to produce individuals who are intellectually, spiritually, emotionally and physically balanced and harmonious based on a firm belief in and devotion to God. Such an effort is designed to produce Malaysian citizens who are knowledgeable and competent, who possess high moral standards and who are responsible and capable of achieving a high level of personal well-being as well as being able to contribute to the betterment of the family, society and the nation at large.”

In the world of education, preschool education is an important early experience. An effective, meaningful and interesting school education and learning experience can give students skills, confidence and a positive learning attitude. According to [Leng, Hui-Shen et al. \(2021\)](#) preschool education is an informal but institutionalized education that aims to provide children with education that is relevant to their age. Children have various self-potentials that must be developed to the maximum level. Their physical, emotional, social, creative and cognitive development should be emphasized. At the preschool level, the focus of education is on children’s readiness in the aspects of communication, spirituality, attitudes and values, humanity, self-skills, physical and aesthetic development, and science and technology ([Malaysia, 2010](#)). Moreover [Rabi, Mansor et al. \(2020\)](#) added that the activities carried out guided by the contextual approach know learning is a complex multifaceted process that extends beyond drill and stimulus and response type methods. A critical developmental domain in preschool education is fine motor abilities which are necessary for activities such as writing and handling small items. In preschool, it emphasizes on multisensory approach which engages more than two senses, such as visual, auditory, tactile, and kinesthetic as to facilitating better understanding and learning. Based on a finding by [GAMES \(2010\)](#), it is found children who participated in kinesthetic and tactile exercises could improve their fine motor abilities when compared to those who used conventional methods. Thus, based on above issue, this study intends to identify the effectiveness of using multisensory learning style towards the improvement of preschool student’s fine motor skills.

2. Multisensory Approach

2.1. General View of Multisensory Approach

According to research by [Rostan, Ismail, & Jaafar \(2021\)](#) describes it as a combination of visual, auditory, and kinesthetic methods, with kinesthetic involving body movement and touch. According to [Taneja and Sankhian \(2019\)](#), children use all their senses to absorb information, which makes multisensory activities, such as those involving sight, sound, and touch, effective in developing specific skills. Originating from the Orton-Gillingham method introduced by Dr. Samuel Orton in the 1920s, the approach was initially designed to help children with dyslexia and has since evolved into a broader teaching technique that enhances sensory abilities, focus, and motivation in children ([Shofiah & Mawaddah, 2018](#)).

In Malaysia's National Preschool Curriculum Standard (KSPK), the multisensory approach is emphasized in early mathematics, specifically in mastering number concepts. The curriculum encourages activities like counting, recognizing, and writing numbers to build early numeracy skills, forming a foundation for number operations (Lee, 2024). Studies show that multisensory techniques used through games and repetition improve children's reading and literacy skills by providing engaging, hands-on experiences (Lee & Bakar, 2022; Safetyani, Nuryani, & Heryanto, 2019). These activities foster enthusiasm, strengthen learning, and prepare children for more advanced concepts, ensuring a fun and effective learning environment.

2.2. Multisensory Techniques in Preschool Education

Multisensory techniques when teaching preschool children not only use various senses but also make learning more fun and play in addition to reducing children's stress. Preschool children will also not feel bored throughout the teaching and learning process. According to Abigail (2016) There are several main approaches that are multisensory in teaching reading for children who experience letter confusion, such as phono-graphics and simultaneous oral spelling (SOS). will happen when new information can be linked to existing cognitive structures to build a new framework of broader knowledge. The contextual approach also applies a lot of multisensory techniques. A study by the National Institutes of Child Health and Human Development in America found that multisensory learning techniques are the most effective techniques for teaching children who have problems in reading. The study shows that multisensory techniques are more effective than phonetic methods. Multisensory techniques become more effective if sensory input such as the use of bright light, letters using sandpaper can be used. According to Lawrence's study (2009), learning to read and spell depends on the child's ability to listen, see, say and write. A child's failure in this ability causes the child to be unable to master this skill.

2.3. Game Strategy in Multisensory Learning Style

According to Upadhyay (2019), language games is to stimulate students' verbal interaction, boost fluency and confidence, provide a learning context, alleviate boredom, serve as a recovery tool, and offer measurement and enrichment. This strategy benefits children in several ways. First, it helps them practice pronouncing words, phrases, and sentences clearly and accurately. Language games also act as a stimulus, engaging children at different stages of learning—whether at the beginning, middle, or end of a lesson—making the experience enjoyable and interactive. Additionally, language games reinforce learning through repetition, helping students retain information in memory. These activities serve as a form of active review, deepening children's understanding. Games also offer a refreshing break, relieving fatigue and boredom from extended study sessions, helping children regain their enthusiasm. Importantly, language games allow children to use

language in meaningful, real-life contexts by encouraging spontaneous interactions such as asking questions, giving instructions, and guessing. This playful learning fosters critical thinking, listening, and idea generation. [Rosner and Rosner \(1990\)](#) note that preschoolers often experience letter confusion, which gradually resolves as they progress in school. Early learning focuses on two stages: decoding, where letters are translated into sounds, and comprehension, where meaning is extracted. Teachers play a vital role in this process, using tools like letter books and cards to help children recognize and distinguish letters visually ([Gibson & Levin, 1975](#)).

3. Problem Statement

In early childhood education, the development of fine motor skills is an essential component as it allows children to carry out necessary activities such as coloring, writing, cutting etc. Many preschoolers facing difficulties with tasks that require grip control, hand-eye coordination etc. even fine motor skills are important ([Rozenboom, 2020](#)). As this might impede their everyday functioning and academic advancement, if these issues are not being solve, which will also impact on their long-term growth. The implementation of multisensory learning in preschool could improve children's fine motor skills as it requires precise coordination of visual, tactile, and motor processes ([Case-Smith et al., 2015](#)). Little empirical study has been done on how multisensory learning specifically effects on preschoolers' development of fine motor skills although it theoretical benefits. As this come out a knowledge gap how well these approaches can be incorporated into preschool programs and what results will be obtained from it. According to [Bahri \(2024\)](#), preschool educators' awareness and comprehension on multisensory learning is important as it might influences the adoption of these teaching strategies in the classroom. When educators are lack of training and knowledge about the benefit of multisensory approach, they will miss the chance to enhance children's fine motor skills. Thus, it is crucial to gauge educators' understanding to pinpoint out current issues and guide focused professional development initiatives.

In addition, it is important to have a baseline for preschoolers' fine motor skills through standardized tests to understand educators' awareness. As the standardized methods could help educators to track children's development and assess the effectiveness of the intervention which provide an objective assessment of motor skills. These tests are crucial in figuring out is the multisensory approach eventually result in noticeable gains in fine motor abilities ([Feder & Majnemer, 2007](#)) as it need a regular of monitor and assessment. According to research by [Shams & Seitz \(2008\)](#), multisensory teaching strategies have been demonstrated in helping children with learning disabilities-dyslexia or Attention-deficit/hyperactivity disorder (ADHD) however, little known about how specifically they might improve motor skills in children who are typically developing. Gaining an understanding of the relationship between multisensory activities and the development of motor skills can help educators develop teaching methods that could meet the various

needs of preschooler.

In conclusion, preschoolers struggle to acquire fine motor abilities, which might have long-term effects on their development. Although multisensory learning presents potential benefits in improving fine motor skills, little is known about how successful it is, especially in early childhood education settings. So, in this study will assess educators' awareness, students' motor skills level and the impact of multisensory learning to preschoolers' fine motor skills. This study offers a practical insight that promote preschoolers' fine motor skill development and ensure they are ready for learning and development in the future.

4. Research Objective

1. To assess the level of awareness among preschool teachers regarding the importance of multisensory learning in supporting students' development.
2. To measure the level of fine motor skills among preschool students using a standardized assessment tool.
3. To investigate the effect of multisensory learning style on the improvement of preschool students' motor skills.

5. Method

5.1. Population and Sampling

This study was carried out using a qualitative research approach as to explore in-depth on the implementation of multisensory learning style improve preschool student's motor skills. Qualitative research can explain a person's experience and knowledge in depth and comprehensively (Merriam & Grenier, 2019). This study focuses on famous Islamic kindergarten in city in where participants are educators at the first preschool student's consisting of eight Sensory learning teachers. Three participants (teachers) have been identified; the researcher meets with participants after teaching times to avoid interrupted their working hours.

The sampling techniques that used in this study was purposive sampling in where participants were selected by sampling with the aim of ensuring that the researcher can obtain comprehensive and in-depth information, as well as understanding and making discoveries (Patton, 2014). So, the participants are selected by researcher based on "purpose" to answer the research questions. This sampling is useful when researcher need to locate instances with a lot of information or maximize the use of few resources.

5.2. Research Instrument

The data for this research was obtained through semi-structured interview and observation. Researcher has meet participants face-to-face for interview session which get permission and have consent with participants before the interview session. According to Adams (2015), semi-structured interview uses a combination of open-ended and closed-ended inquiries, frequently with follow-up questions on how or why. The semi-structured interview takes between 45 to 90 minutes to

complete in where researcher ask three questions to participants that aligned with research questions. The observation has been done for 40 minutes per lesson. Researcher stopped when after finding the themes obtained repeated which researcher sure that the research participants made the same practice in the process teaching. The observation sessions have been recorded by researcher as evidence and transcribed to details observational data.

The data analysis for semi-structured interview and observation was using inductive method model. Researcher will first have transcribed the data that have been collected by converting into text for further review. After that, researcher will familiarize the data and doing coding by identify the key phrases and themes based on research objectives. Themes will be developed based on the coding and make interpretation by analysis the themes relate to past literature and research questions.

6. Result

6.1. What Is the Level of Teacher's Awareness towards the Important of Multisensory Learning at Preschools Students?

Based on the responses from the three teachers, they are all familiar with the concept of multisensory learning and have incorporated it into their teaching practice. They recognize that using multisensory approaches can benefit preschool students by increasing their interest in learning, improving their retention of information, and enhancing their focus and memory. The teachers also have experience with training or professional development related to multisensory learning, which has influenced their teaching practice by giving them new ideas and strategies for implementing multisensory activities in the classroom.

Teacher A emphasizes that multisensory learning helps students develop skills and knowledge through a process that involves sensory input, brain processing, idea storage, body response, and adaptation.

Teacher B focuses on the benefits of using different senses (sight, touch, movement, and hearing) to engage students and make learning more fun and effective.

Teacher C notes that multisensory learning can help children become more interested in learning and gain more knowledge, and that they have received training on how to apply multisensory activities with children.

Overall, the responses suggest that the teachers recognize the value of multisensory learning for preschool students and have actively sought out training and professional development to improve their teaching practice in this area. They understand that using different senses can help children learn and retain information more effectively and are committed to incorporating multisensory approaches into their classroom activities and lesson plans.

6.2. What Is Level of Preschool Student's Fine Motor Skills?

It seems that the three teachers have different approaches to measuring and assessing fine motor skills in preschool students.

Teacher A relies on activity, performance of students, and milestones as the primary indicators of fine motor skills. They have used the Pyramid of Learning and Milestones as standardized assessment tools. One of the challenges they face is getting cooperation from parents to provide feedback and information about the child's daily routine and continuing the activity at home.

Teacher B has a more hands-on approach to assessment, relying on direct observation of the child's play and use of fine motor skills. They use various tools such as cotton buds, tweezers, and pencil holders to assess fine motor skills. One of the challenges they face is when a child struggles with grip, even with various activities that have been provided.

Teacher C does not provide specific details on their approach to measuring fine motor skills, but they mention doing assessments with children from time to time. They have assessment tools but do not specify which ones. One of the challenges they face is getting the child to focus and complete the assessment.

Overall, some common challenges in assessing fine motor skills in preschool students include getting cooperation from parents, getting the child to focus during the assessment, and finding appropriate assessment tools that fit the child's abilities.

6.3. Does Multisensory Learning Style Improve Preschool Student's Motor Skills?

Based on the responses of the three teachers, it can be observed that they all incorporate multisensory learning strategies to support the development of fine motor skills in preschool students.

Teacher A uses a combination of theory learning and practice with multisensory activities to strengthen the students' knowledge and memory in a fun way. The teacher also employs specific strategies such as Gross Motor - Fine Motor - Activity Target, Activity - Rest - Activity (A-R-A) Strategy, and Focus = Age \times (2 min - 5 min) Strategy.

Teacher B, on the other hand, emphasizes the importance of incorporating multisensory activities in every step of the lesson plan and avoiding monotony by providing a variety of activities. The teacher noticed that preschool students who received multisensory learning instruction have better fine motor skills and exhibit positive emotions and attitudes towards school.

Lastly, Teacher C suggests using play dough activities and sensory materials such as rice, flour, and sand to promote fine motor skills development. The teacher also observed that students who received multisensory learning instruction are more focused in class and more willing to participate in activities.

Overall, the three teachers recognize the importance of multisensory learning strategies in promoting fine motor skills development in preschool students. They also observed that students who received multisensory learning instruction have better engagement, focus, and motor skills compared to those who did not (**Table 1**).

Table 1. Responses of the three teachers to the questions about multisensory learning and motor skill development in preschool students.

	Multisensory Learning Strategies	Effective Strategies for Fine Motor Skills	Differences Noticed in Fine Motor Skills
Teacher A	Combination of theory and practice	Gross Motor - Fine Motor - Activity Target, Activity - Rest - Activity (A-R-A) Strategy, Focus = Age × (2 min - 5 min) Strategy	Yes, through progress and skill adaptation
Teacher B	Incorporate multisensory activities in lesson plan, variety of multisensory activities to avoid boredom	N/A	Yes, students who received multisensory learning instruction had higher focus and fine motor skills
Teacher C	Plan activities that involve multiple senses, such as play with dough and drawing letters in rice or sand	Play dough activities	Yes, students who received multisensory learning instruction were more focused and easily engaged in activities

7. Discussion

7.1. Teachers' Awareness on Multisensory Learning

Preschool teachers have a high degree of awareness of the value of multisensory learning. Participants' dedication to professional growth in multisensory learning demonstrates their appreciation of ongoing development and their proactive pursuit of methods to improve their teaching and learning process. Each teacher highlights unique facets of multisensory learning that correspond with educational studies on the advantages of it for preschoolers. Teacher A focus on sensory input, brain processing, and adaptation aligns with research shown the importance of sensory integration in cognitive development, as multisensory activities reinforce brain circuits that facilitate learning and memory (Dionne-Dostie et al., 2015). The way that Teacher B emphasizes sensory engagement for enjoyment and efficacy is consistent with studies showing that employing a variety of senses encourages active involvement, which is crucial for early childhood education (Sousa, 2011). Teacher C Increased curiosity and learning further support research showing that sensory-rich classrooms boost students' motivation and engagement (Gregory & Kaufeldt, 2015). Multisensory learning is beneficial for preschoolers, as seen by the teachers' acquaintance, integration of it into teaching process and training.

7.2. Preschoolers' Fine Motor Skills

Preschoolers have varying levels of fine motor skills in where some are probably experiencing difficulties or developmental delays. The varying methods that used by teachers and some challenges that they faced show variety of student ability levels as it difficult to reach age-appropriate of fine motor milestones. Based on findings shown Teacher A employed standardized assessment tools in determining the phases of fine motor development such as developmental milestones and the Pyramid of Learning. However, the continuity of skill reinforcement at home—

which is crucial for the development and improvement of fine motor skills—is limited by the absence of parental input (Case-Smith, 2000). Students may find difficulties to develop abilities like grip and coordination if without constant practice in everyday tasks, which might affect their overall fine motor competence.

Furthermore, according to Teacher B's method more hands-on and tactile, evaluating grip strength and control using pencil holders, cotton buds, and tweezers. Some preschoolers struggle with grip, despite being exposed to a variety of fine motor exercises, points to a developmental lag, though. If children struggle with simple tools and grip control, it may indicate that they require more specialized assistance to improve their fine motor skills (Berninger & Richards, 2002). Based on Teacher C mentions she occasionally evaluates her preschoolers, but faced trouble in focusing. The development of fine motor skills depends on motivation and attention because repeated practice strengthens the brain circuits associated with motor control (Diamond, 2000). Focusing inconsistently may be a sign of insufficient engagement or immature attention abilities as both of impede the regular practice required to improve fine motor skills.

7.3. Multisensory Learning on Motor Skills

Teachers B and C both noted that children that participated in multisensory activities could enhanced their fine motor abilities. Through playing dough, rice, and sand are tactile materials that known to activate sensory-motor pathways and promote finger strength and dexterity, which are essential for the development of fine motor skills (Piek & Dyck, 2004). By including a variety of multisensory exercises, Teacher B helps children avoid boredom and maintain motor skills via consistent, interesting practice.

Teacher A's structured methods, such as Activity-Rest-Action (A-R-A) Strategy and Gross Motor-Fine Motor progression address students' attention spans and maintain their active participation, as both of which are critical for young learners to maintain focus over time. Research demonstrates sensory exercises activate several brain regions, improving concentration and cognitive engagement (Shonkoff & Phillips, 2000). In addition, Teacher C noted multisensory activities make it easier for children to concentrate. Students engaged in multisensory learning exhibited positive attitudes and emotions, according to Teacher B. According to Schunk, Pintrich, & Meece (2008), sensory-based activities produce engaging learning opportunities and foster favourable connections with education in general. In general, the use of multisensory learning styles offers a variety of experiential learning opportunities that enhance motor skills, promote mental health, and cultivate a supportive learning environment.

8. Conclusion

In conclusion, multisensory techniques are highly recommended in improving the fine motor skills of children. Through multisensory techniques, educators are freely to determine the learning methods and styles to achieve improvement for

children's motor performance. Future research should focus on evaluating the effectiveness of multisensory approaches in improving children's achievements in various domains. Comprehensive training and workshops for educators in both public and private sectors are essential to master these techniques. By encouraging preschool teachers to adopt these techniques, the education system can become more effective and meaningful. While the implementation of multisensory methods may require time, their potential to stimulate memory and enhance skills makes them invaluable in the learning process.

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Conflicts of Interest

The authors declare no conflicts of interest regarding the publication of this paper.

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