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THE USE OF SENSORY TEXTILE BOOKS TO ENCOURAGE CREATIVITY AMONG PRESCHOOL CHILDREN: A CASE STUDY

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Abstract:

Sensory textile books are usually made of fabric materials that allow pre-school and young children to interact and play by touching and feeling them, that encourage creativity to their neurodevelopment. This research aims to summarise the findings of how sensory textile books encourage healthy development and growth of the body and mind which can stimulate creativity, imagination, and motor skills among preschool children. The study compared whether the use of sensory textile books encouraged creativity between the preschool children in the General Kindergarten and Montessori Kindergarten. The researchers used a qualitative method where semi-structured and open-ended interviews were conducted with the experts. The expert teachers were selected based on their educational qualifications. The first two experts have Diplomas in Montessori English, and the third expert as \ Master's in Teaching and Learning. Interviews were conducted with the three experts to ascertain which method of learning impacted more the preschool children. The result showed that the children who grew up with hands-on Montessori learning method tend to be much more creative later in their lives. The Montessori Kindergarten method used natural interests and activities that manipulated the muscle to perform tasks, much unlike the formal teaching among preschool children in General Kindergarten. The Montessori system encouraged hands-on learning experiences which is the foundation of creativity and imagination. The present review revealed that sensory textile books played an essential role

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in the healthy development of preschool children, especially in the first five years of their lives. Therefore, the implementation of Montessori system, use of sensory books made of textile materials can be helpful and can be introduced in the Malaysian kindergarten system. Future researchers can consider integrating Montessori learning in the syllabus of preschool children to encourage creativity, imagination, and motor development from a young age. Activities in the sensory books can be designed to train motor skills with simple mechanics for pre-school children. This research will allow other research designers to develop better sensory books to promote creativity and imagination for pre- school children.

Keywords:

Sensory Books, Textile Books, Creativity, Preschoolers

Introduction

Sensory textile books made of fabric materials allow preschool and young children to interact and play with them using their sense of touch, thereby encouraging creativity and neurodevelopment. As such sensory experiences play an important role in fostering creativity, imagination, and the development of motor skills. All these experiences are important skills for young children as they will benefit from them in both the creative and non-creative fields in their daily lives as they grow older. Gilmore, Knickmeyer & Gao (2018), have said that the period between birth and two years is characterised by rapid and dynamic brain development, that plays a significant role in cognitive growth, and is a crucial period for establishing developmental trajectories of neural anatomy and physiology (Gilmore et al., (2018); Nelson and Gabard-Durnam, (2020); Turesky, T. K., Vanderauwera, J., & Gaab, N. (2021). Additionally, the first five years are the most crucial time for the health and neurodevelopment of every child (Molly Wright 2021).

A study in 2021, pointed out that parents frequently used the media as an aid to regulate the violent temperaments and emotions of children, which resulted in the addiction to the media in early childhood (Coyne, S. M., Shawcroft, J., Gale, M., Gentile, D. A., Etherington, J. T., Holmgren, H., & Stockdale, L. 2021). The results of another study revealed that the misuse of technology had undesirable impacts, particularly in children (Güzelyurt & Nayci (2021) ; Zain, Z. M., Jasmani, F. N. N., Haris, N. H., & Nurudin, S. M. (2022).

Susan (2017) suggested the use of technology in the classroom did not enhance learning compared to the traditional style of learning which used pen and paper as sensory aids as the process of writing was completed through the cognitive reasoning between hearing and writing skills. Therefore, her suggestions showed the importance of sensory involvement in learning progress. According to Majumdar (2020), playing acted as an important role in which preschool children could develop in the early stages of their lives as they influenced the sensory development of a child's cognitive sections, such as the brain and body. Thus, including sensory books in the lives of preschool children is one of the ways to help in encouraging creativity, imagination, and motor development in young children.

It was mentioned by Wojciehowski, & Ernst (2018) that fostering creative thinking should begin early in life. Creativity teaches young children to think outside of the box, to solve problems. In addition, creativity makes the daily lives of young children to be filled with fun

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and in turn more fulfilling. Imagination challenges them to think of solutions and innovations that create the output of our thoughts. Imagination in play forms a foundation for conceptual learning (Fleer. 2021). A study was conducted by Holmes, Gardner, Kohm, Bant, Ciminello, Moedt, & Romeo, (2019) examined the connection between creativity, social play, storytelling and language ability of children. The findings revealed there was a relationships between storytelling and language abilities, between type of play, storytelling, and language abilities, and connections between play and creativity and language and creativity. Based on the study it can be understood that both creativity and imaginations are skills that need to be cultivated from a young age.

Research Background

Sensory books refer to books with textiles within them or they are made entirely of fabrics. The primary purpose of making the sensory books entirely with textile materials is to intrigue preschool children and help to interact effectively with them. Moreover, sensory books promote the development of creativity to learn through their senses among preschool children. Thus, playing with these sensory books boosts their learning through manipulation and exploration. Furthermore, the sensory books involve fine motor play, which improves muscle development with the movement of hands and fingers. Also, the movement processes can promote exploratory playing skills with the complex materials that are used in the sensory books. Therefore "Play is essential to development" that allows children to use creativity which develops Imagination, enhances Dexterity, improves Physical, Cognitive and Emotional strength Majumdar (2020).

Literature Review

There are nine points that will be discussed in the Literature Review which include the theory of the usage of texture in design elements that is applied in sensory book, the importance of the sensory book for the preschool children in the learning progress and health development, preschool children ways of learning and the application of the Montessori learning method in the learning of preschool children.

Theory of Texture

Texture is one of the design elements in visual art and design, but at the same time, it is also the surface character of the work created (Ozlem Kaya, Laura Sinziana Cuciuc Romanescu,& Buckner (1995). Davis (1996), defined the term texture as a manipulated three-dimensional surface, substance and visual properties or a recognisable structured surface. Texture can be a tactile or an optical manipulation; tactile refers to the tangible sense of a surface when touched, and optical refers to the visual manipulation of seeing the image or shape of the content (Manjunath and Ma 1996).

David Katz (1925) has argued that the sense of vibration mediates the tactual perception of roughness. Katz hypotheses that the psychological responses when a harsh surface moves over the skin and do not provide vibrational cues. According to Hollins. and Risner (2000), vibration and spatial are the two stimulation components that contribute to perception. A study was conducted to investigate the sensitivity of texture to the visual system in humans so as to overcome the inherent limitations in the multidimensional data demonstration, (Ravishankar Rao, Gerald & Lohse 1996).

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Montessori Learning

Some prior studies had shown that Montessori learning methods could influence the ability to develop creativity among children. An evaluation on creativity among children was done throughout one academic year by Fleming, Culclasure and Zhang (2019) using the Evaluation of Potential Creativity. The results revealed that Montessori students did slightly better, compared to non-Montessori students. Although creativity is a challenging concept to quantify, many academics agree that it may be "recognised, characterised, and measured."(Cossentino & Brown, 2014–2015, p. 229). The ability to produce works that are original is commonly acknowledged as creativity (Nijstad & Paulus, 2003; Runco & Jaeger, 2012, as cited in Fleming, Culclasure and Zhang 2019).

In a study by Heise, Böhme, and Körner (2010) compared the growth of intelligence and creativity in students who received traditional education and those who received Montessori education. It was discovered students enrolled in lower-fidelity and higher-fidelity Montessori programmes showed better improvements in executive functioning, social problem-solving, and academic achievement indicators, such as reading, maths, and vocabulary. High-fidelity Montessori school refers to pure Montessori teachings, usually consisting of trained Montessori Teachers, multi-age classrooms, use of Montessori materials, child directed work and uninterrupted work periods. While low-fidelity refers to a mix of Montessori and non Montessori like the use of books, and worksheets. Students who learn with the Montessori learning method also performed better in geometry and had higher levels of creativity. This study supports that Montessori method that fosters more creativity than the traditional learning method. The educational approach provided by the Montessori learning method allows preschool children to take the chance to participate in learning opportunities that are independent, exploratory, and tailored to the specific learning styles of preschool children. There is other research that have also indicated that collaborative learning and free choice in activities occur most frequently in learning situations where children perceive themselves to have some level of control (Amabile & Gitomer, (1984); Ryan & Grolnick, (1986).

Preschool children's Development: 4-5 Years Of Age

According to Espy K.A (2009), colourful storybooks showed that task efficiency varied significantly with age, and inhibition efficiency improved significantly between the ages of 3 and 4. And a child's ability to switch showed much development between the ages of 4 and 5 years. Preschool children between 4 and 5 years, like to organise objects into categories, play sorting activities, such as animal lotto or organise buttons into shapes and colours. When children are four, they begin to develop a "big picture" perspective of the world. They start to notice how people differ from one another, in terms of relationships, sex, and ethnicity. Playing is primarily for children's enjoyment. It's crucial to avoid turning the play into "lessons." It is necessary to provide children with a stimulating atmosphere, ample playtime, and the freedom to make decisions.

Children with sensory disabilities will have a larger bearing on emotional and social issues, according to Cruz, Espinoza. and Donoso,. (2021). According to their study, parents of preschool children with sensory impairment, have a greater number of issues than the parents of normal preschool children. Sensory processing factors, such as body awareness, balance, touch, and social participation, are predictive of the quality of engagement in play in a home environment among preschool children. As such preschool children include sensory processing

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abilities to engage and participate when playing, according to Roberts .T, Stagnitti . K, Brown .T, Bhopti .A (2017).

A study by Nekitsing, Birtill, Cockroft, Fildes, Hetherington (2019), showed that most preschool children could benefit from sensory play and storybooks to help increase their vegetable intake. In their study, storybooks and sensory plays were methods used to help children learn more about unfamiliar vegetables. The prediction was that illustration and congruent storybooks could increase the intake of an unfamiliar vegetable, like celeriac, compared to an incongruent storybook such as a carrot. Celeriac, also known as celery root, is the bulb of a celery plant, not to be confused with the more common celery. Congruent storybooks use coherence means of putting stories together so that it is understandable. Incongruent storybooks refer to stories not being understandable. In this case, adding congruent sensory play alongside the storybook would produce a synergistic effect on the intake of celeriac. In this study in November 2017, the participants were 337 children of ages between 2 and 5 years who were recruited to participate. The results showed that the children who had read the storybook had a higher likelihood of consuming the celeriac compared to the incongruent storybook. Sensory play, congruent or incongruent, further extended the likelihood of eating celeriac among non-eaters compared to storybook-only conditions, which proved sensory learning can be used to teach children to eat vegetables.

Figure 1: Celeriac

Source: Google images

Importance of Sensory Book foe Preschool Children

According to Dr Chen Luyi (Oriental Daily News 2020), the Honorary Executive Director Penang of Special Children Association, mentioned that multi-sensory and gestures help in remembering words. Images depict and communicate cultures, so that preschool children can absorb information about other cultures from these images. Unlike other topics that are limited by words and language, the abstract nature of art makes it easier to learn.

According to Williamson, Gordon, Anzalone, and Marie (2001), sensory exploration increases the likelihood of preschool children being able to overcome difficulties in absorbing and reacting to the information from the senses, allowing them to better explore the environment around them. In this research, there was a wide array of disciplines from the medical, therapeutic, educational, mental health, and psychosocial fields that presented information on the sensory development of preschool children from birth to three years. The monograph discussed new directions and described assessment and intervention approaches designed to promote the self-regulation and adaptive behaviour of young children.

As such the use of sensory methods, in multimodal surroundings, helps the human brain to develop, learn, and function properly. Multi-sensory training regimens are more effective for learning and can mimic better natural environments (Ladan, Aaron. & Seitz (2008).

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According to a report on " Only About Children" (2022), revealed that multiple sensory plays support the development of preschool children and encourage open-ended and creative play. Preschool children begin to investigate the world around them by building connections and strengthening the neural pathways to the brain as early as birth when they are surrounded by sensory stimuli on a daily basis. A child's senses aren't entirely developed when they are born. As babies, preschool children explore the sensory world around them, as they mature over time. With each new encounter, a distinct sense creates nerve connections that help to shape their brain's architecture. Playing is a great way for kids to learn and preschool children are able to improve their fine motor abilities, hand-eye coordination, and understand early measurement principles.

According to an investigation experiment on "A Comparative Study of Children's Concentration Performance on Picture Books: Age, Gender, and Media Forms" by Ma, Min-Yuan Wei, Chun-Chun (2016), children in Grade 3 expressed higher concentration and interest in picture books than children in Grade 6. They suggested that talking books or e-books, which provide multi-sensory stimuli, should be selected for elementary school children.

These activities in sensory books engage multiple areas of the brain and can help learners develop stronger memories. When sensory materials are in some ways related to the subject being taught, they can help learners to understand essential concepts; many learners rely on some senses more than others. The young learners' attention can be drawn to the mouth while speaking. This allows children to see and hear words as they are formed. It is even better to add touch and movements. Multi-sensory involves movements, or called sixth sense, for babies as they gather so much information this way. If the baby does a physical activity related to the word that involves touching, then the child has more brain connections related to the word.

Importance of Sensory Book and Sensory Experience

Every child can thrive by the age of five is an argument suggested by Molly Wright (2021), an advocate for early childhood development. Wright noted that the first five years of a child's life are the most important in its development and health, as its brain doubles in size after the first year. According to Wright, parents can shape preschool children by doing five basic things: connecting, talking, playing, creating a healthy home, and creating community.

Wright also stated that these five things are what help the brain to reach its full potential. Imitation games between parents and the child help to increase imagination as well as empathy, naming games help build vocabulary and attention, and games like peekaboo build memory and trust. These simple games are actually shaping a child more than one might think, and show that simple games should not be ignored or replaced by technological devices. These games strengthen the relationship between the parents and the child, forming human connections and creating a healthier mind that will transform the child's future life skills. Interactions are extremely important and should be done as often and as early as possible.

Improving early child development with words was mentioned by Fitzgerald (2014). She mentioned that language is the most important interaction needed by babies and preschool children. A baby's brain at 35 weeks weighs only two-thirds of what it will weigh between 39 and 40 weeks. This enormous growth shows an increase in capacity and desire to learn languages. Babies learn mostly from their caretakers. Interactions between caretakers and babies are language-learning exercises. In 2014, Dr. Brenda Fitzgerald referenced to an

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experiment called "The still face experiment" that was conducted to support this idea. The experiment was from the Harvard Child Development Center. “The Still Face Experiment” was first presented in 1975, by Edward Tronick and colleagues at the biennial meeting of the Society for Research in Child Development. The still face experiment was when the mothers turned away and returned to their babies with a still facial expression. The babies tried to engage with their mothers by making coo noises, pointing, reaching out, eventually getting frustrated and crying. This proved that babies were hard-wired to their needs, craved and focused on their mothers' attentions, thus proving that babies constantly watched and craved for interactions that taught them language (Fitzgerald 2014).

Fitzgerald further noted that when parents talked to their babies they encouraged actual neurological development in their brains. The development of the brains of babies depends each time a word is said, as it stimulates the neuron. When each time the word is repeated, the ability for the baby to learn is increased. Therefore, interaction is what teaches the baby. This process is language nutrition, is the basis on which they depend on to learn, and the long-term effects are very profound. Learning a language is a basic foundation of learning that leads to the development of neurons in the brain to learning a language. The early mastery of language leads to the ability to read, which leads to success in school and later to higher education in a university or college. It is also important that young children learn to read, but after a certain age, they should read to be able to learn. If they fail to do so, they may struggle to make sense of what they read, putting them at a disadvantage.

Fitzgerald in 2014, conducted a research called the “Social Experiment” that supported language learning where the results were not determined by wealth, racial colour, different physical needs, gender, and the number of toys given to them at a young age. Success in the research was determined by the interaction between parents and their children. This three-year research proved that a baby that interacted with its parent could know 30 million or more words compared to a baby that did not interact with its parents.

Textures Help In Preschool children’s Learning Progress

Human brains are made up of trillions of brain cells (neurons) and nerve connections (synapses). Sensory activities can strengthen sensory-related synapses and functions in the brain and build nerve connections in the brain, which can lead to a child's ability to complete complex learning tasks. The news from Zaobao SG on 11th September 2017, mentioned Han Baode, a scholar who vigorously advocated aesthetic education in Taiwan, concluded that "There are four senses of the human body, which are taste, touch, vision and hearing." Touch always comes after taste, and it shows that humans rely on touch to learn and develop the things that happen around them and accelerates the efficiency in learning, so it is also reflected by preschool children.

According to Angeline Lillard (2012), sensorial techniques like the Montessori method has been used in education techniques. Engaging in sensory play will support preschool children' sensory processing and stimulating the tactile systems in the child's body through the sense of touch that will allow the child to understand better.

Negative Effects of Technology on Development and Growth of Preschool Children

The Sun daily newspaper published online on 13th September 2021 reported there was a growing number of children addicted to smart devices and the main reason for this phenomenon

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was the Covid-19 pandemic. In April 2020, the Ministry of Education Malaysia announced that all public and private institutions needed to apply online learning methods at home. Teachers and students were required to keep on learning at home to prevent further spread of the epidemic. Online learning is inseparable from the assistance of technology that offers many opportunities for preschool children to play, explore, and learn (Linebarger & Piotrowski, 2009).

The Free Malaysia Today, published an online article, (19 June 2021), by Nora Mahpar She said home-based learning provided low efficiency in learning lessons because of home-based learning fatigue; many teachers also admitted that some students become tired, which caused a decline in attendance in online classes. The way to boost motivation to study is by using offline materials to gain back students focus (Free Malaysia Today 2021).

The screen time for children should be controlled effectively by using the ANCHOR concept, to reduce gadget addiction. There is a guideline from WHO on physical activity, sedentary behaviour and sleep for preschool children under five years of age. The guideline recommended the screen time for children should be controlled to a maximum of an hour in a day and reading materials and storytelling activities should replace electronic devices, Prof Dr Nora Mat Zin (2021).

According to James Brindle (2018), a case study mentions that many preschool children are watching videos that can be addictive. Moreover, continuing watching these videos may influence the dopamine which is a type of neurotransmitter and hormone found in the body functions that influence movement, memory and pleasurable reward and motivation. Brindle also noted that signs of unhealthy mental state and addiction could be found in most preschool children. When parents tried to stop them from watching, they would be angry, cry out of frustration. Thus, Brindle argues that technologies should be thoroughly tested before used as entertainment (James Brindle 2018).

Spatial Ability

Puzzles are a very common type of game. They are widely used as a fun way to develop logical reasoning and important connections in the brain, especially in children (Silva et al. 2015). In 2018, Diaz Renavitasari and Afif Supianto studies on “Educational Game For Training Spatial Ability Using Tangram Puzzle” mentioned that Spatial Ability could be characterised as a psychological skill that was used as a benchmark by individuals seeking employment or entering a field. This ability is important for computer-graphics, engineers, and architects. Tangram is one of the tools that is well-known to help in training geometry reasoning skills. The use of the black-box method, is able to train, identify, classify and analyse the shape, when there is no guide on the background (using black-box method), it works to help train spatial ability.

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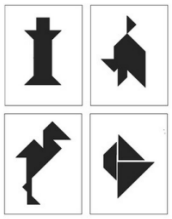

Figure 2: 35 Different Tangram Puzzles - Black & Color

Source: teacherspayteachers.com

Therapy of Art Helps to Maintain Health of Preschool Children

According to Judith (2005) in the *Book of Child Art Therapy* 25th edition, art therapy has gone beyond the psychiatric settings and is found and used in hospitals and clinics. Art addresses preschool children empathically, especially those with disabilities or mental and emotional health issues who need empathic and not just medical help. Art has been used to "heal" since ancient times; this shows that the art process is simple but natural though art therapy is highly sophisticated. Art is a symbol of speech from the unconscious brought out spontaneously through association and with the artist's interpretations (Naumburg. 1966). Art can provide a way for people to integrate uncomfortable or conflicting impulses and emotions in a visual and aesthetically pleasing form.

Art therapy creates opportunities for preschool children to develop creatively as well as discover their own art styles and, in turn, themselves. Therefore, art can encourage the uniqueness and originality, creating confidence and independent thinking of preschool children. As such every child requires space for art with the proper lighting and materials available to encourage creativity without being afraid of making a mess that leads to disapproval from adults. Time for art should also be given as practice will allow better development and exploration (Rubin, 2005).

In art therapy, safety is one of the important points for preschool children, as they need to feel emotionally secure in expressing themselves through their artwork. Thus, adults and peers alike should respect the opinions and artworks of preschool children by listening and having honest conversations in a way that urges them to express their thoughts and opinions. All expressions should be accepted; whether they are "bizarre" or realistic, negative or positive as art therapy should allow exploration and imagination. Adults should help and supervise preschool children to understand the proper way of using the art materials. For example, some kids may be tempted to eat paint or smear it on furniture and people; for safety reasons, this should be stopped (Rubin 2005).

When children are between a year and two, they are at an age where they can be seen as manipulating art—allowing them to manipulate materials to create art but not using actual art materials as they may be harmful. For instance, clay, sand, mud and sometimes even food can be used to create sensory qualities similar to actual art materials. The kinaesthetic experience of "painting", making marks, moulding and creating things in the simplest terms is important as they expose them to art. When they are between two and three years, they will mature more intellectually and physiologically and have better control of their body motions, leading to a purposeful and deliberate charge of how they form and handle clay and paints.

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When they are between two and three years, they are more likely to practise and show their control over art materials by repetitions of certain motions. Simple patterns will be repeated at this age, such as lines, circular scribbles, and dots. Then gestalts, shapes and objects are drawn as they have seen them. The representation of the object may not be obvious or seen at this stage, but steps in creating forms with intention show great measures of progress. When preschool children are between three and four years old, they start naming marks or objects as real things; this is influenced by watching adults. Though what is drawn or painted may not look or resemble the actual objects, as they are named. The drawings show that the identity of objects are adaptable due to their association to the forms (Rubin, 2005).

While art education can and does solve issues, according to Fran (2009), research has shown that art education has associations with mathematics, reading, critical thinking, and cognitive and verbal skills. Art have been known to promote focus, motivation, self-assurance and good team-building skills.

In Malaysia, knowledge of art has only been focused in secondary schools for underperforming students. Visual arts in Malaysian schools have traditionally meant drawing and painting classes. The focus is frequently on the product rather than the process of creation and therapy. Moreover, formal art education is absent among students in the science stream, and visual art is perceived to be only for poor students. Art as a subject is viewed as "easy" or leading towards jobs with unstable income like freelance or gigs. But actually, art can affect their self-esteem and happiness, which in turn affects their motivation in their studies Based on the learning contents of the visual art education syllabus for secondary schools, the level of exposure to the understanding of visual art seems to be weak as the learning objectives focus more on the technical skills of students to produce artworks rather than on knowledge about art (Vethamani 2016).

Art play an important role in helping students to gain knowledge from other cultures. Students would usually replicate existing art forms. which come from other than their own culture. According to Maaruf, Siraj, Hashim, Zulkifli (2013) society is considered as a substance for students when they create an art piece. This is because it is essential for the students to foresee the implications of their artwork as they would be presenting society morally. As art projects can foster multi-ethnic tolerance among students, it is a social medium of communication between certain cultures or groups. It raises Gelineau awareness of cultural values, attitudes, and beliefs, and is a tool that both instils and defines a sense of common ancestry and identity. Gelineau (2012) suggested that art can be used "as aid to helping preschool children understand cultures different from their own, the arts can play a vital role not only in illuminating origins and customs but also in awakening awareness of the universality of the human spirit" (p. 11).

Problem Statement

The advancement of technology has created numerous educational issues among young children as they are unable to develop their imagination, creativity and motor skills. In 2020, Zahra Kassam found that toddlers were exposed to technology when they were babies, as even the toys given to them were battery-operated, with lights and sounds and they operated with a click of a button. She also noted that parents were doing all they could to provide babies and young preschool children with all sorts of battery-operated toys with alphabets and numbers, hoping these might help children to be more intellectual but were only marketing techniques used to convince parents to buy them. Most parents are unaware that cognitive development

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relies on babies getting loving connections and interactions with their parents as well as ensuring an environment that allows for healthy learning habits. To put it simply, babies are beginning to learn. With the correct type of toys in their environment, they will learn lifelong skills and habits such as concentration, focus, perseverance, creativity, and problem-solving, to name a few. Though technology has been argued to encourage self-learning in preschool children, it can also interrupt their creativity and development and excessive use can affect their health, thoughts and behaviour. Generally it is known that too much screen time can lead to bad vision, poor concentration and responsiveness, not to mention lack of supervision, inappropriate or violent content on the internet can cause mental and emotional harm on impressionable preschool children.

In Jean Piaget's theory of cognitive development (1976), it is suggested that children move through four different stages of intellectual development which reflect the increasing sophistication of their thoughts. As kids are from birth to 18-24 months they are under sensorimotor stage and their goal is object permanence, as toddlers know that an object still exists, even if it is hidden. The sensorimotor stage forms the cognitive development, as infants and toddlers acquire knowledge through sensory experiences and by manipulating objects. The entire experiences of children at the earliest period occurs through basic reflexes, senses, and motor responses.

To combat internet addiction, Chinese officials issued new regulations in 2021, that limited the amount of time as minors could play online games for just one hour per day, including Fridays, weekends, and public holidays. In addition YouTube has been popular amongst kids of between 3 and 5 year olds of the current generation. An experiment was done in 2020, that showed the preschool children and young kids were the most active on YouTube, especially on YouTube Kids. The YouTube kids channel has more than a billion views, and about 60 million members as of November 2022. The ChuChu TV Nursery Rhymes and Kids Songs were the most subscribed kids' content channel. El Reino Infantil, a Spanish-language channel, came in second with 53.7 million members, and Little Baby Bum took third with 40.2 subscribers (Ceci,2021).

The above explanation reveals the excessive importance of technology among young children has not encouraged the spontaneous development of their cognitive and sensory faculties.

Research Gap

Learning is a process which involves mental activities that occur as a result of the process of active interactions with the environment to achieve changes in the forms of knowledge, understanding, behaviour, skills and attitude values. Jean Piaget's Cognitive Theory (1976) is one of the founding principles from which constructivist teaching approaches are cultivated. It is also acknowledged that knowledge is linked to actions, and to learn one must displace, connect, combine, take apart and reassemble objects (Sriastuti, & Masing, 2022).

While sensory learning has proved to play an important role in child development among Montessori preschool children , there is a lack of recent studies on the importance of sensory learning for the general preschool children. Sensorial learning, creativity and creative problem solving are skills found in Montessori learning. According to Raja (2011), a study was conducted and the results showed that children had different ways of framing and solving problems that were different from each other. This method of problem solving was done by

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their own creative thinking, with the exploration of different positioning of materials and the applications of their own individual creative solutions. It was also noted that their own personal interest and experiences influenced their creative problem solving skills. The Montessori learning strategies encourage children to explore their environment on their own free will, encouraging their individual interests. A study was conducted by Fenech. (2020), on the ways Montessori sensorial materials were used based on the sensorial stimulation theory, as to how sensorial materials stimulate and engage with the senses to enhance learning at two local Montessori schools. The results showed that there were many different benefits in sensorial play, the most frequent being the enhancement of the fine and gross motor skills. Skills such as the enhancement of eye-hand coordination, language skills development, the capability to differentiate between objects, and the enhancement of mathematical skills also showed improvement with the exposure to sensory learning.

According to Narasimhan(2019), an experimental study was conducted based on the seven principles of Leonardo DaVinci known as Sensazione, which referred to the heightened awareness of senses, was used as a tool to increase creativity. A comparison of creativity was done using the Test of Creativity-Drawing Production (TCT-DP) before and after exposure to a series of sensorial exercises. The Test illustrated heightened awareness of senses to creativity while establishing the scoring dimensions of the TCT-DP as a holistic method for assessing creativity.

There was also an evaluation by researchers (Culclasure, Fleming, & Riga (2018) on Montessori Education in the Public Schools in South Carolina to observe the performances on tests that evaluated creativity, work habits, social skills, and executive function between cohorts of Montessori students and non-Montessori students. A cohort of students in a high-fidelity. Montessori school was selected and tracked across four years and was compared with non-Montessori students in a demographically similar school in a different school district. The results varied over time, but the Montessori cohort of students often performed similar to or better than non-Montessori students in examinations of executive functions. The study also showed the Montessori students were significantly higher than the non- Montessori students in creativity. Between the two groups, there was no discernible variation in their social or working routines.

The technology involved in early childhood education can be seen in many forms, like , television, film, internet accessed on any device, video games, tablet or smartphone apps and games and other associated electronic gadgets. In 2017, Susan M. Dynarski denied the statement that the use of technology in the classroom did not enhance learning compared to the traditional style of learning which used pen and paper. The sensory aid and reason in the process of writing is completed through the cognitive reasoning between hearing and writing skills and shows the essence of sensory that is involved in learning progress. Since humans are perceptual animals, their urge to survive depends on their capacity to use their senses. While contemporary technology has made life easier, it has also prevented people from using their senses to perceive the world, which has led to the continued decline in their sensory abilities.

The benefits of sensory play through sensory books can stimulate preschool children to investigate and explore through their senses. On top of that, it also encourages them to use methods of observation, to form hypotheses, to make experiments and conclusions, and simplify scientific methods. As such preschool children will have a better sense of absorbing

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sensory information as they build brain-to-nerve connections, support language development and problem-solving skills and develop motor skills among them.

According to Robertson & Riek (2022), language skills play a vital role in the development of intellect during early childhood. During this period when children are mastering and developing their language skills necessary stimulus should be given, if not they will have limited intellectual development. Early language development involves four skills, namely hearing, speaking, reading, and writing. In 2023, Fadhilah and Hendratno did a study to analyse the effects of Metal Insets Media with sensory motor. The study showed that Metal Insets media acted as a writing aid that stimulated early childhood writing ability that involved sensory motor. This research was related to Montessori's research of how humans control their surroundings with their hands and change it in accordance with the direction of their minds, which is inextricably linked to their body morphology and abilities. The Metal Insets application is linked to the Montessori approach, that has four pillars, such as sensitive periods, a prepared environment, sensory education and spontaneous activity through repetition (Fadhilah & Hendratno 2023).

According to Maria Montessori, "Nothing comes from the intellect that does not come from the senses." The statement shows that preschool children are natural sensory explorers and learners. They need sensory help and aids to explore the world, things and matter around them in their growth. Sensory kits and teaching materials play an important role in the learning process and from Zaobao SG on 11th September 2017 can prove this; one of the online news articles from Singapore has stated that Virtual technology is not conducive to learning and may be one of the factors that has caused preschool children to become lazy.

Research Objectives

RO1: To identify how sensory books influence preschool children.
RO2: To develop a sensory book that encourages a more traditional method of learning for preschool children.

Research Questions

RQ1: How do the feature of simple mechanics in the textures of sensory books influence the natural responses of preschool children to interact with them?
RQ2: What are the features of the sensory books that influence creativity among preschool children'?
RQ3: How do sensory books with textures and simple mechanics influence preschool children?

Methodology

Phenomenological research was the selected approach in this qualitative study as it describes the common meanings of the lived experiences among individuals of a concept or a phenomenon (Creswell & Cheryl, 2018). Phenomenologists focus on describing what all participants have in common as they experience a phenomenon. Creswell & Cheryl (2018) have mentioned the investigation of this phenomenon is usually conducted with a group of people who have all personally experienced it. Consequently, a diverse group can be found, which can range in size from three to four people to ten or fifteen.

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In this research, the researchers used a qualitative method, to be specific interviews were used to answer the research questions. The interview questions for the experts were semi structured and open-ended. According to Saul McLeod (2019), the process of selecting a sample provides a representative group of the population. As such researchers do not need to study the entire population to gather sufficient insights (Research LifeLine, 2012). However, as the sample would be used to draw conclusions about the population, it is important that researchers know how the data entered into the database is a critical part of the analysis arrive at a conclusion. (Turner, 2020).

According to Ranjit Kumar (2018), selection of the number of experts is determined by the data saturation point. Thus, the sample size is saturated and determined by the third expert. In this case, the sample consists of experts in the field of education of children. Specifically, a kindergarten teacher, a kindergarten superior teacher and a teacher with years of working experience with children were selected. The interviews were done online as per requested by the interviewees due to time restrictions and the data was recorded via screen recording. According to Bhardwaj (2019), a selected few based on judgemental sampling also known as purposive sampling has its benefit. One of which is that researchers faced fewer problems when selecting samples. This method of selection of samples makes it easier for the researchers to communicate the desired results with the target audience. The criteria in selecting the samples for this research were based on experience, background and occupational positions.

According to Von Soest (2022), having experts as interviewees has three main advantages. The first being that the experts may add to any experimental findings on how decisions were made in practice (Fu and Simmons, 2021) The researchers may blend general results with the information in the context-specifically that are more often not found in the public domain. Secondly, current, political science addresses "big" questions that cannot lead to any experimental or statistical analysis as this holds true in cases where the number of observations is meagre. Experts can aggregate and weigh different pieces of information with expert interviews. Thirdly, expert interviews can supply data that link the macro and micro levels of analysis.

In this study the three experts that are interviewed are as followed;

Participants	**Method of Interview**	**Participants' Details**
Expert 1	Online interview using Google Meet	**Background:** 25 Years Old 3 Years of experiences in teaching early childhood classes Currently teaching a toddler class; Teacher from Montessori Preschool **Qualification:** Diploma In Montessori English
Expert 2	Online interview using	**Background:** 37 Years Old Early Childhood for 9 years

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	Google Meet	Teacher from Montessori Preschool **Qualification:** Diploma in Montessori English
Expert 3	Online interview using Google Meet	**Background:** In education field with 8-9 years (since late 2013) Teacher from specialist kindergarten & Primary School Child psychology in thierry education **Qualification:** Degree in Psychology Masters in Teaching and Learning

Results

Based on the interviews with all three experts, it was found with more exposure to sensory experiences there were higher chances of the children being hands-on learners. They were exposed to sensorial experiences at an early stage that required physical manipulation, such as doing and undoing buttons. Early exposure to different sensorial features promoted hands-on approaches to solve problems. Expert 3 suggested that the children who were exposed to sensorial learning were expected to be much more creative later in their lives. In addition Montessori preschool children advanced at a slightly faster pace compared to the children taught using the general methods.

Based on the interviews with all three experts it was found that all Kindergarten schools, Montessori and Non-Montessori that were based on the government's education syllabus. had the same academic standards. There were notable differences after the exposure to sensorial experiences of touch, and play in the learning experiences. Expert 3 noted that the children in the general education were learning motor skills such as using Velcro, looping shoelaces, and fastening buttons between the ages of four and five. Experts 1 and 2 noted that in Montessori learning, toddlers between - two and three years old were already exposed to such levels of motor skills. Expert 3 stated that all the motor skills, including fine motor skill, were used by the age of 3, and were enhanced between 4 and 5 year olds. Expert 3 stated that the quantity of sensory experiences used among Montessori children influenced their level of motor skills, creativity and imagination. In addition, textures and simple mechanics also fostered creativity and motor skills among preschool children ,

Expert 2 noted that bright colours attracted the attention of children. Thus vibrant colours helped to encourage preschool children to engage with the mechanisms. Expert 1 suggested that besides the colours and mechanisms, having topics that were interesting to most children, such as Animals as a topic helped to build interest, interaction and longer attention span. Expert 1 noted that most preschool children physically stroked and touched pictures of animals in encyclopaedia books. As such they likely enjoyed sensorial books that had features that imitated animal textures.

Montessori teachers like Experts 1 and 2 stated that preschool children, who were between the ages of three and five years, were already exposed to alphabets, numbers, colours and shapes in kindergarten. The Experts also stated that these were all set by the educational system that

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all kindergartens had to follow. The compliance meant that including alphabets and numbers into the designs of sensory books would be effective for preschool children to engage with things that could help them learn in a fun way. The sensory experiences in these books require varieties so as to make them more effective, with sensory interactions such as touch, sound and sight.

Expert 3 mentioned that in Malaysia, there was less opportunity to apply Montessory teaching methods in lessons. Often parents rely on the use of devices to assist in teaching their toddlers and preschool children. All three Experts agreed that there was an increase in the quantity of electronic devices that aimed to enhance children's education. These devices were in many forms such as videos and games, that many parents heavily relied presently. The experts also pointed out that due to the easy accessibility of such devices, parents often neglected to include an adequate amount of physical learning, even though it had been proven that hands-on learning was more effective and beneficial to their child's motor skills development. Experts 1 and 3 had stated that preschool children benefited when they touched and felt physical objects when learning. They also emphasised that learning through devices deprived preschool children of the necessary sensory experiences that provided healthy development.

Discussion

Sensory books involve a hands-on approach that is often used in Montessori education. These approaches include puzzles and matching games that have velcros, buttons and zippers, among other things. According to Fleming, Culclasure & Zhang (2019), the characteristics of school environments can impact the development of creativity in children, in which context the Montessori system was used. The results showed Montessori students performed better on the Evaluation of Potential Creativity assessment than non-Montessori preschool children. It was shown that based on the results of children who studied using the Montessori method were more effective in learning compared to those who use of digital learning devices. These devices like tablets offer interactions which were too fast, that prevent memorization among the preschool children. In fact preschool children tend to be attracted by the interactions but did not focus on the story. On the contrary, experiences with hands and all senses, activated memorization, and kept the mnestic trace. Ponticorvo, Di Fuccio, Ferrara, Rega & Miglino, (2019) had proven by an experiment that was carried out with 3 conditions namely multisensory materials, only digital with touch-screen, an a traditional book (a game-book). Each story had three variants with symmetric stories. The participants in this study included 24 students, (14 males and 10 females). The results showed that, throughout the experiments, the preschool children remembered the stories better when they used the Multisensory materials, as the average of correct replies were higher in the Multisensory condition, followed by the Book and by the Tablet.

As most books available to children between the ages of four and five are made of paper, the activities and materials used do not provide as many sensory features as compared to sensory books that are made of fabrics. Based on the interviews preschool children were naturally inquisitive and explored through a sense of touch, even when the book features were flat graphical designs without textures. Thus, adding textures with colourful, interesting, and simple mechanics features in books, preschool children were highly eager to engage naturally to solve and explore the sensory books. Simple features of mechanics may include activities that promote motor skills that can be used by preschool children in their daily lives, that include such as using buttons, velcro, zippers, shape recognition amongst others.

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Through these hands-on learning experiences, preschool children will begin to develop their creativity and imagination, as there is no rule or limitation when playing with the sense of touch. Thus, textures in sensory books will influence creativity. In addition, through the use of these materials and simple mechanics the children can also be introduced to simple tasks. According to Kusumawardani, Nani and Sulistiani (2020), the method of using visual aids, including puzzles and picture cards that are included in the Montessori learning method improve motor skills development in children between the ages four and five. In 2020, it was suggested by Kusumawardani, Nani and Sulistiani in their article that with sensory teaching aids, children were able to acquire knowledge of the real world and form. With sensory refinement as the goal, when children have a sense of touching, seeing, feeling, listening and tasting, they are able to create a category for each new sensory input in the brain (Kusumawardani, Nani and Sulistiani,2020). Thus, sensory books are largely used in Montessori learning. These sensory books foster the intellectual qualities of children; and develop their abilities and also provide stimuli for their motor skills.

Motor skills refers to skills that involve muscle activity, thus it requires practice and repetition in order to excel at them. According to Mualli, Rofiki, Listrianti, Vinori, Muhaiminah, (2022) it is stated that having implemented motor-sensory play in early childhood may also increase their concentration and focus. Montessori studies also trained children in participation, as Experts 3 shared that "Children who learned with Montessori methods could be more creative and these children will be more willing to do things with their hands as compared to children not from Montessori background". The Montessori studies did encourage preschool children to try, experience, explore possibilities. Children and preschool children who have learned under the Montessori teaching method will be more willing to do things with their hands as compared to children who are not exposed to sensory experiences/learning. Experience helps in developing memory and children who have learned with sensory exploration/experience will be more creative and more advanced in motor skills. This was agreed by all the Experts who were interviewed.

According to a study conducted by Kayılı, (2018) to discover the effects of Montessori education on preschool children, showed that the method decreased the number of errors and extended the reflection time among them in the treatment group. Montessori education method with its different textures and simple mechanics allowed for simple fun activities. This result conforms with Expert 3 who suggested, Montessori preschool children were comparatively more advanced than the general kindergarten preschool children. The results showed that the quantity of sensory experiences used on Montessori preschool children did influence the level of creativity and imagination.

Based on the results of the interviews, this study on the Montessori preschool children revealed that sensory learning was crucial in fostering creativity, imagination and motor skills. Sensory exploration increases the ability to absorb and react to the information from the senses, allowing preschool children to explore better the environment around them (Williamson , Anzalone, 2001).

Conclusion

Based on this study, future researchers can consider to integrate more sensory and Montessori learning into the syllabus of the learning system of preschool children. Sensory learning can

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also be considered as a traditional method of learning, as it involves activities like art and crafts rather than the use of battery operated devices that are steadily increasing.

This is the first study in Malaysia to apply the Montessori education method. There are limited research findings that have examined sensory books which are workable in the Malaysian market. Through the study, it has been discovered that there is a need to encourage Montessory learning in the education system in Malaysia. The results of the interviews with experts and teachers who have been teaching preschool children have revealed there is an opportunity to promote Montessori education method in the education system in Malaysia to cultivate creativity among the young. Malaysia.

This research could help future researchers to further understand the importance of sensorial experiences in child development. With the increase in technology and electronic devices, it is important to encourage parents and teachers to include sensory play that is vital for the development of motor skills, creativity and imagination among preschool children. The researchers hope that this study will also boost the availability of sensory tools in the child education market and the industries for children. This research will additionally aid other researchers in understanding sensory learning better, as there is limited research on this topic.

- There are limited sources available on this research topic like sensory books from the standpoint of art and design. The topic focuses more on textures which are usually used in the two-dimensional forms for graphic designers in children's books and picture books for children. In this case, the researchers were studying how textures in the three-dimensional sense influenced creativity, sensory play and healthy neurodevelopment. As such, the researchers had limited information from previous studies on textures in sensory books. They had to look into sensory plays and experiences on their influences on child psychology and textile and spatial cues in vibrations through touching.
- Time limitations also affected the researchers' ability to observe the final output results fully. As the development age of children is the first five years of their lives, the researchers were only able to observe an individual interaction only. The researchers observed how the preschool children of the ages between two and three could use the final output of the sensory books, with little or without any guidance. The ability to use the sensory books to teach the child how to interact with them, is a good way to analyse the success of the final outcome. The researchers were not able to observe, analyse and compare the development of preschool children for a span of five years.

In conclusion, the team found that sensory books resulted in creativity, imaginations and motor skills among preschool children. As designers of sensory books, it is important that creativity and imagination are encouraged in the younger generations as they are the future generations of designers and artists. Sensory books will provide the foundation needed to develop the future generation. Motor skills are also beneficial for both people in the creative and non-creative field, as in most if not all jobs people require the use of their hands in order to function completely in their daily lives. Furthermore, sensory books allow preschool children to learn in a more enjoyable way, encouraging them to benefit in the learning process, through their senses.

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