https://nawalaeducation.com/index.php/JOG/index
Volume 2 Nomor 3, November 2025
e-ISSN : 3047-6259
DOI : https://doi.org/10.62872/egy8a810

Sensory Play in Early Childhood Education: The Key to Stimulating the Brain and Creativity of Young Children

Arjulayana
Universitas Muhammadiyah Tangerang
e-mail: arjulayana@umt.ac.id

INFO ARTICLE

Accepted : October 05, 2025
Revised : November 23, 2025
Approved : October 20, 2025
Publish: November 28, 2025

Keywords:
brain development, creativity, early childhood education, sensory play, stimulation

ABSTRACT

Sensory play has become a foundational component in early childhood education because it stimulates neural development, creativity, emotional regulation, and fine motor control through direct multisensory engagement. This study employs a systematic literature review of 34 peer-reviewed publications to synthesize evidence on how sensory play promotes brain activation and creative capacities in young children. The findings demonstrate that tactile experiences, movement-based sensory activities, symbolic and dramatic play, and structured multisensory learning tools consistently strengthen cognitive functioning, emotional stability, imagination, and motor coordination. Sustainability requires alignment among teachers, school leadership, parents, and communities to institutionalize sensory play as a long-term pedagogical priority rather than a supplementary activity. This study contributes by mapping the mechanisms, learning components, and sustainability requirements that enable sensory play to function as a holistic developmental framework in early childhood education.

INTRODUCTION

Sensory play has emerged as a central element in early childhood education because it provides the most natural and developmentally appropriate stimulation for the brain systems of young children. During the first six years of life, the brain grows rapidly and forms neural connections driven by sensory input, movement, emotion, and exploratory experiences. Research shows that when children manipulate textures, shapes, sounds, scents, and movement-rich materials, the sensory cortex activates alongside the regions responsible for executive functioning, problem solving, and creativity (Brusilovsky, 2024). Sensory play therefore supports the foundational architecture of learning by promoting multisensory processing and cognitive flexibility. These early sensory experiences create neural networks that later support advanced reasoning, literacy, numeracy, and self-regulation, underscoring that sensory play is not a recreational activity but a neurodevelopmental necessity (Gascoyne, 2016).

In addition to neurological growth, sensory play strengthens children's creativity by fostering open-ended exploration and imaginative thinking. Activities involving kinetic sand, water, clay, paint, loose parts, dramatic play, and dance give children space to transform sensory input into expressive symbolic actions. Studies show that artistic and kinesthetic play expands divergent thinking and innovative behavior because children can experiment without fear of mistakes and receive feedback from tactile experiences rather than evaluation from adults (Payne & Costas, 2021). Dance-

based sensory play, for example, improves early executive functioning and cognitive processing because movement supports memory, sequencing, and idea generation rooted in bodily awareness (Faber, 2017). Creativity is therefore not merely a spontaneous trait but the result of enriched sensory environments that allow children to integrate perception, emotion, and imagination.

Sensory play also creates strong emotional regulation benefits. Young children do not regulate emotions through abstract reasoning but through sensorimotor experiences such as squeezing, rubbing, jumping, swinging, splashing, molding, and rhythmic movement. Sensory activities calm the nervous system, increase focus, and stabilize mood because they stimulate proprioceptive and vestibular systems essential for self-regulation (Macintyre, 2016). The pediatric field recommends sensory-based environments because children are more emotionally secure and internally organized when learning includes tactile and kinesthetic experiences rather than exclusively verbal instruction (Yogman et al., 2018). However, in the digital era, many toys stimulate attention but not deep sensory engagement. Without tactile and movement-based experiences, emotional resilience and creativity may weaken over time (Healey et al., 2019). Therefore, sensory play protects both cognitive and emotional development.

The benefits of sensory play extend to children with diverse learning needs, including autism and developmental delays. Play therapy involving sensory stimulation improves communication, social engagement, emotional expression, and structured behavior because sensory activities reduce cognitive overload and offer alternative modalities for interaction (Elbeltagi et al., 2023). Sensory environments support intersubjectivity, helping children build emotional connections with peers and adults through shared rhythms, gestures, and imagination (Trevarthen & Delafield-Butt, 2016). Even for neurotypical learners, sensory play strengthens compassion and empathy because sensory experience activates embodied awareness and emotional understanding (Lucre & Clapton, 2021). These findings confirm that sensory play forms the foundation of social-emotional intelligence.

Motor development is another major domain supported by sensory stimulation. Activities such as finger painting, squeezing sponges, tracing sand patterns, tearing paper, building blocks, and scooping materials strengthen fine motor control that later underpins writing and self-help skills. Research shows that structured sensory play significantly improves hand strength, bilateral coordination, and precision motor skills in early childhood (IIyas & Amal, 2024). Montessori-based sensory books and multimodal materials provide multisensory pathways for cognitive development because children learn classification, comparison, and discrimination through touch and movement (Hermawan & Dewi, 2024). Sensory learning therefore builds the physical foundations of intellectual functioning.

Recent research also highlights the role of sensory play in stimulating entrepreneurial and problem-solving dispositions. Children engaged in sensory exploration demonstrate stronger curiosity, initiative, risk tolerance, and experimentation—traits associated with entrepreneurial mindset development (Ferdinand et al., 2023). This means sensory activities not only prepare children academically, but also embed innovation tendencies that are valuable for future global challenges. Sensory play therefore builds twenty-first century competencies from early childhood.

The rise of at-home sensory play, including DIY activity kits, shows that sensory stimulation does not require expensive facilities but can be supported by

parents using household materials. Studies demonstrate that sensory play increases significantly when families are equipped with guidance, materials, and knowledge to support sensory learning beyond school (Al Fathia et al., 2024). Parental reinforcement improves child development outcomes because sensory stimulation becomes consistent across school and home environments (Maulida et al., 2023). Additionally, sensory toys developed through community creativity such as Playmate Sensory kits provide accessible models for scalable sensory-based learning interventions (Rahmawati et al., 2025). This suggests that sensory learning can become a powerful community-based educational movement.

Although evidence strongly supports sensory play, existing literature presents several research gaps. First, Abidin et al. (2022) analyzed the significance of sensory activities for sensory skill development but did not map how sensory play influences creativity in parallel with sensory growth. Second, Payne and Costas (2021) demonstrated creativity benefits of dance-based sensory activities but did not examine their impact on neural stimulation or cognitive outcomes. Third, Rahayu et al. (2023) presented a literature review of sensory activities for fine motor development but did not analyze sensory play from a holistic brain–emotion–creativity framework. These gaps show the need for a synthesis that connects sensory stimulation, cognitive growth, creativity, emotional regulation, and motor development.

The novelty of this study lies in integrating multidisciplinary evidence to identify how sensory play strengthens brain development and creativity simultaneously, across cognitive, emotional, and motor dimensions. The objective of this research is to systematically review recent literature to determine the mechanisms through which sensory play stimulates the brain and creativity of young children and to identify sensory-based learning principles that can be implemented effectively in early childhood education.

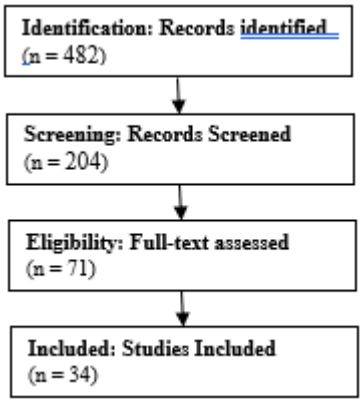
METHODOLOGY

This research applied a Systematic Literature Review (SLR) to synthesize empirical and conceptual findings on the impact of sensory play in early childhood education. Database searches were conducted through Scopus, Web of Science, and Google Scholar using keywords including “sensory play”, “early childhood sensory learning”, “tactile stimulation”, “creative development in preschool”, and “sensory-based pedagogy”. Articles were limited to the past ten years and included studies that discussed sensory play outcomes related to cognitive development, creativity, emotional regulation, or motor stimulation.

Inclusion criteria consisted of peer-reviewed publications on early childhood education, studies implementing sensory play interventions, and research that examined developmental outcomes linked to sensory stimulation. Exclusion criteria involved papers focusing solely on recreational play without learning outcomes, reports unrelated to early childhood, and studies that did not include measurable developmental indicators. The screening procedure followed the PRISMA model: Identification (n = 482) → Screening (n = 204) → Eligibility (n = 71) → Included (n = 34).

The final 34 articles were analyzed using thematic synthesis to identify patterns in sensory play methods, developmental outcomes, and classroom or community implementation models. Coded dimensions included sensory modalities used, cognitive and creative outcomes, emotional regulation effects, motor development impacts, and parent–school collaboration patterns. The synthesized results form the structure of the

discussion sections that follow.



RESULTS AND DISCUSSION

Mechanisms of Sensory Play in Stimulating Brain Development and Creativity in Early Childhood

Sensory play stimulates brain development through neural activation driven by tactile and multisensory input. During early childhood, the brain forms billions of synapses through experience-dependent learning, and sensory stimulation acts as the primary catalyst for synaptic growth. When children manipulate textures, resistive materials, scents, or sounds, their sensory cortex is activated simultaneously with neural regions responsible for cognition, emotion, and executive functioning (Brusilovsky, 2024). This multisensory engagement builds rich neural pathways, supporting later academic learning by enhancing processing speed, working memory, categorization, and attention. Sensory play therefore functions as an early neuroarchitectural foundation rather than a recreational tool. Children who frequently engage in sensory play acquire better neural readiness for literacy, numeracy, and higher-order reasoning because sensory input accelerates integration between perceptual and cognitive brain systems (Gascoyne, 2016).

Creativity also develops substantially through sensory play because imaginative thinking emerges from sensory perception. When children engage with sensory materials such as sand, foam, water beads, clay, and natural objects, they rely on sensory interpretation to invent new uses, create symbolic representations, and generate unique solutions. The absence of rigid rules encourages divergent thinking because sensory experiences promote exploration rather than performance compliance (Payne & Costas, 2021). Children learn to think beyond conventional boundaries when they transform sensory materials into models, stories, or characters. Dance-based sensory activities further illustrate this mechanism; movement stimulates spatial and rhythmic cognition while simultaneously encouraging spontaneous creative expression rooted in bodily awareness (Faber, 2017). Creativity becomes a natural cognitive output of sensory stimulation when children are free to investigate and express ideas without evaluative constraints.

Sensory play also plays a crucial role in emotional regulation and internal balance essential for learning. Young children do not control emotional intensity through abstract reasoning but rather through sensorimotor experiences that support proprioceptive and vestibular feedback. Activities like squeezing clay, feeling water flow, bouncing, or rhythmic dancing regulate arousal levels and reorganize emotional states by calming the nervous system (Macintyre, 2016). When children reach an emotionally regulated state, the prefrontal cortex becomes more available for problem

solving, communication, and creative exploration. Pediatric research has shown that children exhibit improved learning engagement after sensory-rich play because emotional security and neuronal calm support attention and memory (Yogman et al., 2018). Conversely, the lack of sensory stimulation in early childhood, especially when replaced by passive screen-based toys, increases dysregulation and decreases sensory responsiveness (Healey et al., 2019). Thus, sensory experiences lay the emotional foundation for creativity and cognition.

Sensory play is particularly impactful for children with autism spectrum disorder and other developmental challenges because it provides accessible and nonverbal modalities to build communication and emotional connection. Play therapy incorporating sensory tools has been found to improve social awareness, reduce behavioral stress responses, and increase interaction motivation, as sensory activities provide predictable and soothing input that helps children organize emotional and cognitive responses (Elbeltagi et al., 2023). Intersubjectivity research emphasizes that shared sensory experiences between children and educators create emotional bonds, supporting the development of empathy, trust, and collaborative imagination (Trevarthen & Delafield-Butt, 2016). When sensory play becomes a relational practice rather than an individual activity, it enhances social cognition and emotional expression, stimulating creativity through shared symbols, gestures, and narratives.

Motor development is also strengthened through sensory stimulation because tactile manipulation and hand movements improve neural control of the fine and gross motor systems. Sensory activities such as finger painting, tearing, cutting, rolling, scooping, and pincer grasp tasks build hand muscles, bilateral coordination, and hand-eye integration, forming the basis for writing and self-help skills (IIyas & Amal, 2024). Sensory books and multimodal Montessori-based resources further improve cognitive and motor development by requiring children to classify textures and identify differences through touch, stimulating memory and problem solving through sensory discrimination (Hermawan & Dewi, 2024). As motor and cognitive stimulation reinforce each other, sensory play becomes a developmental bridge connecting physical growth with intellectual readiness.

Emerging studies also highlight the role of sensory stimulation in shaping future-oriented cognitive dispositions such as innovation, problem solving, and entrepreneurship. Sensory exploration builds curiosity, initiative, risk tolerance, and cognitive flexibility because children learn to assess uncertainty and embrace experimentation as part of learning (Ferdinand et al., 2023). Children exposed to complex open-ended sensory experiences exhibit longer persistence during challenges and are more likely to reattempt tasks after failure because sensory feedback supports coping skills. Thus, sensory play not only supports early development but also shapes lifelong learning patterns.

Community-based research shows sensory play can be implemented effectively across home and school contexts when parents and teachers share responsibility. Parental awareness programs and sensory play kits empower families to provide sensory stimulation beyond the classroom, increasing developmental continuity (Maulida et al., 2023). Sensory home-based DIY activities contribute to fine motor development and creativity without requiring expensive equipment, showing that accessibility is not a barrier when families have knowledge and motivation (Al Fathia et al., 2024). Sensory learning thus becomes a scalable pedagogical movement with the potential to impact children across socio-economic backgrounds.

Taken together, sensory play stimulates brain development and creativity through perception-driven neural activation, imaginative thinking, emotional regulation, social connection, motor refinement, and curiosity-driven problem solving. Sensory play emerges as an inherently holistic developmental mechanism rather than a supplementary activity.

Components of Effective Sensory Play Environments and Their Influence on Child Development (with Table)

Different sensory play environments produce different developmental outcomes. Synthesized findings from the selected literature show that four core components consistently produce the strongest results in stimulating brain development and creativity: tactile sensory materials, movement-based sensory experiences, dramatic and symbolic sensory play, and structured multisensory learning tools. Programs that combine multiple sensory modalities demonstrate deeper developmental gains because brain systems integrate information across touch, movement, imagination, and emotion (Brusilovsky, 2024). Sensory play environments are most effective when children experience autonomy, novelty, repetition, and freedom for symbolic transformation rather than rigid adult-directed activities (Gascoyne, 2016).

Sensory Environment Component	**Key Features**	**Developmental Effects**	**Supporting Literature**
Tactile sensory materials	Sand, foam, clay, water, loose parts	Neural activation, fine motor development, emotional regulation	Macintyre (2016); IIyas & Amal (2024)
Movement-based sensory play	Dance, jumping, balancing, rhythmic motion	Executive functioning, emotional resilience, creative fluency	Payne & Costas (2021); Faber (2017)
Dramatic and symbolic sensory play	Role play, story creation, expressive art	Imagination, empathy, socio-emotional awareness	Trevarthen & Delafield-Butt (2016); Lucre & Clapton (2021)
Structured multisensory tools	Sensory books, Playmate kits, Montessori materials	Cognitive development, sensory discrimination, problem solving	Hermawan & Dewi (2024); Rahmawati et al. (2025)

The evidence indicates that sensory play environments must be intentionally designed rather than left to chance. For example, tactile sensory materials activate somatosensory networks essential for building concentration, body awareness, and sensory integration, which later support literacy and numeracy learning (Macintyre, 2016). When children manipulate textured and resistive materials, they strengthen fine motor precision, which builds the muscular foundation needed for writing and hand-controlled tasks in school (IIyas & Amal, 2024). Without regular tactile experiences,

children may struggle with foundational physical skills required for academic tasks that depend on fine motor coordination.

Movement-based sensory play supports brain development by stimulating vestibular and proprioceptive systems that regulate energy levels, attention, and executive functioning. Rhythmic motion in activities such as sensory dance, balancing, and coordinated jumping improves impulse control, working memory, and cognitive fluidity because neural activation occurs simultaneously in motor and prefrontal regions (Payne & Costas, 2021). Movement also amplifies creativity because ideas are generated in alignment with embodied patterns rather than exclusively via verbal processes. Dance-based sensory play demonstrates that creativity can emerge from bodily cognition, reflecting interconnectedness between motor and cognitive processes (Faber, 2017).

Dramatic and symbolic sensory play integrates imaginative thinking with emotional and social learning. When sensory materials become symbolic objects within storylines and pretend situations, children practice empathy, emotion recognition, and social collaboration (Trevarthen & Delafield-Butt, 2016). Sensory-based symbolic play helps children understand others' perspectives and build internal representations of emotions, deepening socio-emotional intelligence. Sensory compassion-focused activities additionally develop emotional insight and internal calm, supporting emotional maturity and creative meaning-making (Lucre & Clapton, 2021). Therefore, sensory play becomes a platform not only for cognitive development but also for emotional and relational growth.

Structured multisensory learning tools, including Montessori-style sensory resources and Playmate Sensory kits, demonstrate strong developmental benefits when used intentionally. Sensory books promote classification, discrimination, and memory retention by encouraging comparison among multiple textures and patterns (Hermawan & Dewi, 2024). The Playmate Sensory kit strengthens sensory and cognitive development because tasks are intentionally designed to stimulate multiple modalities simultaneously and build neural coherence across sensory systems (Rahmawati et al., 2025). Tools that systematically incorporate sensory input help children transfer sensory learning to problem solving and symbolic reasoning.

Synthesis of the literature indicates that the most effective sensory environments combine multiple components rather than focus on a single modality. Children develop more powerful brain and creativity outcomes when tactile, movement, symbolic, and structured modalities interact in a single learning ecosystem. Sensory play becomes strongest in environments that allow experimentation, autonomy, peer interaction, and emotional safety. Therefore, sensory play is not defined by materials alone but by conditions that allow children to construct meaning freely and experientially.

Sustainability Challenges and Strategic Solutions for Sensory Play Implementation in Early Childhood Education

Although sensory play has been proven to stimulate brain development and creativity in young children, the sustainability of its implementation depends on structural, pedagogical, cultural, and family support factors. Many early childhood institutions acknowledge the importance of sensory play, yet they face limitations in maintaining consistency due to competition with academic expectations, insufficient teacher training, limited material resources, and misconceptions among parents regarding sensory-based learning approaches (Gascoyne, 2016). When sensory play is

implemented only occasionally or as an extracurricular activity, its developmental impact is weakened because children require repeated multisensory stimulation for neural plasticity and emotional regulation to form strong developmental foundations (Brusilovsky, 2024). Thus, the primary barrier to sustainability is not the concept of sensory play itself, but the systemic readiness of schools to adopt sensory-based learning as a core pedagogical priority.

Teacher readiness is a leading determinant of continuity in sensory play pedagogy. Teachers who are trained in sensory-based learning and developmental neuroscience tend to provide richer sensory experiences with intentional design, deeper scaffolding, and reflective dialogue during play (Macintyre, 2016). Conversely, teachers with limited understanding of sensory development may restrict children's autonomy, limit messy play, or replace sensory stimulation with worksheet-based activities. This shift is usually driven by pressure to accelerate academic performance rather than support developmental readiness, although research clearly indicates that sensory stimulation strengthens the cognitive foundations for literacy and numeracy (Yogman et al., 2018). Teacher training therefore needs to emphasize how sensory stimulation strengthens symbolic thinking, creativity, and executive functioning so teachers see sensory play as academic infrastructure rather than a distraction.

Leadership and school policy play a critical role in determining whether sensory play becomes a sustainable educational culture. Schools that institutionalize sensory play through curriculum integration, scheduled sensory sessions, indoor and outdoor play area design, and ongoing professional development are able to maintain consistent implementation across school years (Alharbi & Alzahrani, 2020). Leadership that prioritizes sensory-based pedagogy encourages teachers to take creative instructional risks, experiment with materials, and document developmental progress using observational and qualitative approaches rather than standardized testing. When leaders promote sensory play as a school identity, parents begin to support the approach, teachers feel secure in implementation, and children benefit from structured repetition of sensory experience (Gascoyne, 2016). Sustainability therefore requires administrative vision, not just teacher enthusiasm.

Another critical aspect of sustainability is the availability of accessible and affordable learning materials. Sensory play has often been perceived as requiring specialized equipment or expensive toys, but research consistently shows that meaningful sensory stimulation can be created with low-cost or household materials, including water, sand, rice, pasta, clay, natural objects, recycled packaging, and loose parts (Al Fathia et al., 2024). Community-based resource development also provides sustainable solutions; for example, locally developed Playmate Sensory kits demonstrate that materials can be intentionally designed to stimulate multiple sensory modalities without financial burden (Rahmawati et al., 2025). In addition, sensory books and multimodal Montessori-based materials provide long-term cognitive benefits because they require sensory classification and comparative reasoning (Hermawan & Dewi, 2024). Sustainability therefore depends on strategic material planning and collaboration rather than budget size.

Parental perception is another determinant of sustainability. Some parents underestimate messy or exploratory play, believing that academic worksheets and reading drills signal stronger learning. However, when parents receive guidance on the role of sensory play in brain and creativity development, their involvement increases, resulting in continuity of sensory experiences at home (Maulida et al., 2023). Research

shows that workshops, take-home sensory kits, and parental coaching foster a shared belief that sensory stimulation supports emotional resilience, problem solving, and cognitive development (Al Fathia et al., 2024). Parental support also contributes to sustainability by reducing resistance to activities involving water, paint, loose parts, or outdoor sensory experiences that may be perceived as messy but are developmentally valuable (Healey et al., 2019). When families reinforce sensory play, developmental gains become stronger and more stable.

Sensory play also contributes to inclusive education sustainability because it supports children with diverse developmental needs. For children with autism or sensory processing challenges, sensory play reduces cognitive overload, increases self-expression, and enhances emotional connection through predictable and calming tactile experiences (Elbeltagi et al., 2023). Sensory-based group games strengthen intersubjectivity, empathy, and cooperative imagination, supporting socio-emotional growth for both neurotypical learners and children with disabilities (Trevarthen & Delafield-Butt, 2016). Schools that commit to sensory play contribute to inclusive learning cultures because sensory-based activities provide multiple entry points for participation and communication.

To achieve sustainability, early childhood institutions need pedagogical documentation systems that track developmental growth in creativity, motor skills, emotional resilience, and cognitive readiness supported by sensory play. While sensory learning outcomes are not always numerically quantified, practitioners can document progress using observation checklists, learning narratives, and visual portfolios to demonstrate how sensory activities build foundational readiness for later academic tasks (Macintyre, 2016). Documentation helps teachers make instructional decisions and encourages parents and administrators to value sensory learning because developmental progress becomes visible.

Sustainability also requires a cultural shift in how society conceptualizes early childhood education. Historically, early childhood instruction has been viewed as babysitting or pre-academic preparation instead of a developmental window for neuroplasticity and creativity. Yet research overwhelmingly demonstrates that early sensory stimulation builds the brain's cognitive architecture, shapes lifelong learning patterns, and strengthens emotional and creative capacities essential for adulthood (Brusilovsky, 2024). When sensory play is recognized as a scientific and developmental necessity rather than an optional enrichment, schools and families become more committed to maintaining it. A society that values sensory learning in the early years invests in long-term educational quality, creativity, and mental well-being.

Overall, sustainability depends on systemic alignment among teachers, leadership, families, and communities. Sensory play can be maintained long term only when all stakeholders understand its developmental role and contribute to a stable and stimulating sensory environment for children.

CONCLUSION

Sensory play forms the primary developmental foundation for young children by stimulating neural growth, creativity, emotional regulation, motor coordination, and socio-emotional intelligence through multisensory stimulation and exploratory learning. Sensory experiences activate brain systems responsible for cognition and imagination, while open-ended play encourages creative expression, resilience, and problem solving. Evidence shows that children learn most effectively when sensory play becomes the core

of early childhood pedagogy rather than a supplemental or recreational activity, demonstrating its central role in preparing children for later literacy, numeracy, and higher-order reasoning.

For sensory play to become sustainable, it must be supported through teacher readiness, school leadership commitment, parental collaboration, strategic material management, inclusive learning environments, and documentation of developmental outcomes. Stakeholders should reinforce sensory learning across home and school settings, create cultures that value sensory-based learning rather than oppose messiness, and design environments where tactile, movement-based, symbolic, and structured multisensory materials interact cohesively. When these conditions are achieved, sensory play becomes a long-term developmental force that strengthens children's brain development and creativity, helping them grow into emotionally secure, innovative, and adaptable individuals prepared for future learning demands.

LITERATURE

Abidin, A. S. Z., Ishak, S. N., Bakar, R. N. A., & Rahman, A. A. (2022). Significance of sensory activities among toddlers for sensory skills development. Environment-Behaviour Proceedings Journal, 7(SI7), 15-27.

Al Fathia, R., Nugraha, A., & Ratri, D. (2024). Analisis Permainan Sensory Play DIY (Do It Yourself) di Rumah yang Mempengaruhi Perkembangan Motorik Halus Anak. Jurnal Desain Indonesia., 6(2), 136-155.

Alharbi, M. O., & Alzahrani, M. M. (2020). The importance of learning through play in early childhood education: Reflection on the Bold Beginnings Report. International Journal of the Whole Child, 5(2), 9-17.

Annisa, T. N., & Mulyana, A. (2024). Implementasi Media Kegiatan Terapi Bermain Sensorik Untuk Anak-Anak Berkebutuhan Khusus di Desa Surakarta, Kabupaten Cirebon. Kiddo: Jurnal Pendidikan Islam Anak Usia Dini, 5(1), 229-238.

Brusilovsky, B. (2024). The architecture of play, sensory and cognitive stimulation: From childhood to adolescence. LOS LIBROS DE LA CATARATA.

Chahyani, I. N. C., & Istiyani, D. (2025). Stimulasi Keterampilan Sensorik pada Anak Usia Dini Melalui Media 3 Dimensi Diorama Tentang Kisah Nabi Ibrahim AS. Kiddo: Jurnal Pendidikan Islam Anak Usia Dini, 6(2), 527-541.

Elbeltagi, R., Al-Beltagi, M., Saeed, N. K., & Alhawamdeh, R. (2023). Play therapy in children with autism: Its role, implications, and limitations. World journal of clinical pediatrics, 12(1), 1.

Faber, R. (2017). Dance and early childhood cognition: The Isadora effect. Arts Education Policy Review, 118(3), 172-182.

Ferdinand, N., Hidayat, T., Hanif, H., & Riyanto, S. (2023). Exploring the Impact of Sensory Activities on the Development of Entrepreneurial Spirit in Children. Pasundan Community Service Development, 1(2), 32-37.

Gascoyne, S. (2016). Sensory play: Play in the EYFS (Vol. 1). Andrews UK Limited.

Healey, A., Mendelsohn, A., Council on Early Childhood, Sells, J. M., Donoghue, E., Earls, M., ... & Williams, P. G. (2019). Selecting appropriate toys for young children in the digital era. Pediatrics, 143(1), e20183348.

Hermawan, D. S., & Dewi, A. K. (2024). Potensi Buku Sensori Berbasis Montessori dan Multimodal Terhadap Perkembangan Kognitif Balita Usia 3-5 Tahun. REKA MAKNA: Jurnal Komunikasi Visual, 4(2), 178-191.

IIyas, S. N., & Amal, A. (2024). Penerapan Media Sensory Play dalam Menstimulus Kemampuan Motorik Halus Anak Usia 5-6 Tahun di TK Tunas Kasih Makassar. Teaching and Learning Journal of Mandalika (Teacher) e-ISSN 2721-9666, 5(1), 123-130.

Lucre, K., & Clapton, N. (2021). The Compassionate Kitbag: A creative and integrative approach to compassion - focused therapy. Psychology and Psychotherapy: Theory, Research and Practice, 94, 497-516.

Macintyre, C. (2016). Enhancing learning through play: A developmental perspective for early years settings. Routledge.

Maulida, L. F., Hatta, R. G., Sari, A. N., Jannatul, N., Wahidah, S. N., & Maulina, R. (2023). Pengaruh Pendampingan melalui Kit Sensory Play terhadap Pengetahuan Ibu dari Anak Stunting tentang Stimulasi Perkembangan Anak. Jurnal Kreativitas Pengabdian Kepada Masyarakat, 6(2), 442-450.

Mellinia, N. M., Mulyanti, F., & Priendarningtyas, A. (2025). Upaya Meningkatkan Perkembangan Kognitif Melalui Aktivitas Sensori Pada anak Usia 4-5 Tahun di KB-TK Quantum Bekasi. Arus Jurnal Pendidikan, 5(2), 206-212.

Payne, H., & Costas, B. (2021). Creative dance as experiential learning in state primary education: the potential benefits for children. Journal of Experiential Education, 44(3), 277-292.

Rahayu, E., Sari, N. I., Saputri, R., Dewi, K. M., Rahmawati, P., Putri, M. V., & Sofiyanti, I. (2023, November). Literatur Review: Macam-macam Permainan Sensory Play untuk Meningkatkan Motorik Anak. In Prosiding Seminar Nasional dan CFP Kebidanan Universitas Ngudi Waluyo (Vol. 2, No. 2, pp. 864-876).

Rahmawati, D., Setyowati, S., Ningrum, M. A., Adhe, K. R., & Kristanto, A. (2025). Pengembangan media pembelajaran Playmate Sensory sebagai stimulasi indera pada anak usia dini. JIIP-Jurnal Ilmiah Ilmu Pendidikan, 8(7), 7675-7683.

Trevarthen, C., & Delafield-Butt, J. (2016). Intersubjectivity in the imagination and feelings of the infant: Implications for education in the early years. In Under-three year olds in policy and practice (pp. 17-39). Singapore: Springer Nature Singapore.

Yogman, M., Garner, A., Hutchinson, J., Hirsh-Pasek, K., Golinkoff, R. M., Committee on Psychosocial Aspects of Child and Family Health, & Council on Communications and Media. (2018). The power of play: A pediatric role in enhancing development in young children. Pediatrics, 142(3), e20182058