

## MULTISENSORY METHODS IN THE PRESCHOOL SETTING

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**Abstract:** Multisensory stimulation occurs when two or more sensory receptors are stimulated simultaneously. In order to effectively and accurately perceive an object, the brain combines information from the senses of sight, sound, touch, and kinaesthetics. Learning new skills can also benefit greatly from this integration. In order to improve early literacy skills in normally developing preschoolers, this chapter examines multisensory processing and its application. Although there is a lack of empirical research on the effectiveness of multisensory instruction for early literacy skill acquisition, the few studies that do exist have been carried out in ecologically valid settings and offer useful insights into the ways in which these strategies can be utilized to benefit the early literacy development of young children. In addition to the traditional visual and auditory only methods (for example, the instructor presents a printed letter and says the letter name and/or sound), these strategies may incorporate both a tactile and kinaesthetic component (for example, tracing and manipulating letters with fingers).

The focus will be on how these multisensory techniques can be used at home and in preschool. To help scaffold early literacy learning, teachers and parents should use multisensory strategies. However, in order to precisely determine the advantages of multisensory processes and instruction in early literacy learning, additional carefully controlled studies are essential.

**Keywords:** multisensory processing, early literacy, teaching, learning, preschool children.

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The brain's ability to efficiently process and respond to incoming stimuli is essential to our survival in this world. Stimuli may be unisensory in an artificial setting like a cognitive research laboratory, activating only one type of sensory receptor. However, stimuli typically simultaneously activate multiple types of sensory receptors in real-world environments. Seeing a fire engine, for instance, will activate visual, auditory, and tactile sensory receptors, as will hearing the siren and feeling the wind blow by. Multisensory activation is the simultaneous activation of multiple types of receptors. Multisensory input may involve four or more senses, be it bi-modal (such as visual-auditory), tri-modal (such as visual-auditory-tactile), or both. The neurological mechanisms that underpin the processing of multisensory stimuli and the ways in which multisensory input can be utilized to optimize teaching strategies and learning in educational settings have sparked a growing interest over the past ten years. The current understanding of multisensory processes and the role that multisensory teaching approaches play in the early literacy education of normally developing children will be discussed in this chapter. The review will begin with a discussion of what is known about multisensory processing, including how sensory receptors receive information and

how the brain processes it. This section will discuss the crucial role that early experience plays in the creation of an effective multisensory integration system. There is evidence to suggest that the sensory systems may be utilized to enhance the acquisition of new knowledge, such as written language, especially in the early years when young children are primed to respond to multisensory experiences to discover their world. As a result, we will look at studies that have taught early literacy skills to children with typical development using multisensory learning strategies. The findings of this study are also discussed in terms of their applications in the home and preschool settings. The chapter comes to a close with recommendations for more research.

In education, it is not a novel idea to employ strategies that simultaneously stimulate auditory, visual, tactile, and kinaesthetic inputs. Almost quite a while back, Marie Montessori

Multisensory Techniques for Early Education Learning 203 spearheaded the first multisensory preschool programs for ordinarily creating 3-to 5-year-old kids to set them up for perusing and composing . Physical formation of letter shapes and identification of letter names and sounds were among these pre-reading and writing abilities. By providing children with multisensory experiences such as touch boards, tracing geometric shapes on wooden planes, and tracing and coloring in metal insets, the Montessori program was intended to "educate the senses." Using an integrated tactile, kinaesthetic, visual, and auditory approach, children were taught to trace sandpaper letters with their fingers and simultaneously voice the sound of each letter. For example, the child would see a letter while tracing it and saying and hearing its name and/or sound. Moving alphabets and cardboard letters that kids could hold and manipulate themselves to help them build words, identify phonemes, and articulate words were two additional multisensory materials. Children were learning to develop a conscious, attentive process through these experiences, which were combined with teacher reinforcement and continuous feedback. Although this may be oversimplified, Montessori believed that by combining the senses, touching and looking at the letters at the same time fixed the image more quickly and that looking later became reading and touching later became writing.

Play dough, jigsaw puzzles, and other items designed to encourage children's sensorimotor development are all commonplace in the preschool setting. Additionally, children are surrounded by printed and writing materials (such as story books, alphabet charts, posters, paint brushes, and crayons) designed to develop emergent literacy skills acquired prior to conventional word reading. This emphasised the significance of this sensorimotor period and the necessity of allowing children to learn through exploration of their environment. Play-based

activities with environmental print, alphabet books, plastic/magnetic letters, and games with large cards printed with letters or loose letter tiles and making letters out of play dough are common ways to teach children early literacy skills. Children's interactions with letters could be further encouraged by having them specifically trace letters with their fingers, move their hands around plastic letters, or form letter shapes in the air with large arm movements while saying their name or sound.

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Three boys between the ages of 9 and 10 who were of normal intelligence but had failed to learn to read after three or more years in a public school were used as case studies to further illustrate previous use of multisensory strategies. The multisensory approach started by having the child say a word that he wanted to learn. The researcher wrote the word in large script on a blackboard, and the child watched. The child traced the word while looking at it and saying it aloud to himself. The first two fingers were used to trace each letter of the word on the blackboard. This was said over and over until the child remembered how to write the word correctly. Lip and hand kinaesthetic elements, according to Fernald and Keller, were the crucial link between the word and the visual cue. They reported

that learning occurred at a faster rate because the tactile component enhanced memory, and they emphasized the necessity of tactile experiences like finger tracing. However, it is acknowledged that children can successfully learn literacy skills through a variety of literacy programs that do not explicitly incorporate tactile and kinaesthetic teaching. Orton argued, in a manner that was analogous to that of Fernald and Keller, that the language system and its sensorimotor connections are all interconnected and that literacy and language skills should be taught simultaneously through a variety of sensory modalities. This strategy relied on simultaneously stimulating the kinaesthetic, auditory, visual, and tactile modalities (for instance, words were shown visually before the letters were traced with the finger while the word was spoken).

A multisensory approach can be used for more focused learning or for more informal literacy activities. Children were encouraged to explore letters independently through multisensory activities like self-initiating the tracing of sand paper letters in Zafrana et al.'s multisensory program, which was open-ended. Children, on the other hand, in Bara et al. The participants in the study received direct training on how to interact with letters repeatedly in a specific and sequential manner (for example, by visually following the shape of the letter while running their index finger along its outline). Some children may benefit more from independently engaging in multisensory learning activities than others (for instance, more advanced children may engage in more complex activities). As a result, multisensory literacy activities may be most beneficial for children of any developmental stage when teachers intentionally scaffold students' learning and encourage them to use multisensory literacy strategies.

We propose, for instance, that a teacher concentrate on the letters on the label of a child's favorite toy or cereal box (such as Weet-Bix). This could be accomplished by simultaneously pointing to the letter W on the box and looking at it (visual), saying its name and hearing its sound (auditory), making the letter shape in the sky (kinaesthetic), and tracing its shape on the box (tactile). Making letters out of a variety of materials, such as clay or natural materials from the garden or beach, while simultaneously stating the name and sound of the letter and tracing it may also make letter learning more interesting and stimulating. Children may become motivated to explore letters in a multisensory way by encouraging them to trace letters (with their finger) that they find on surrounding signs, posters, alphabet and story books, or on the packaging of their favorite food at lunchtime.

The development of a child's emergent literacy skills (such as letter identification and phonological awareness) is significantly influenced by the quality of the home literacy environment (such as shared story book reading, letter

teaching, and access to printed materials) (Britto, Fuligni, and Brooks-Gunn, 2006; Byrne and co., 2006; 2008, Hood, Conlon, and Andrews;

1997, Saracho; Snow and co., 1998; Bennett, Weigel, and Martin, 2006). Children frequently have access to print materials like books, magazines, newspapers, magnetic letters, and writing supplies at home. Reading the surrounding print, such as food and toy packaging labels, can also be part of home literacy activities. Otto, 2008; 1996 (PurcellGates). When parents are sensitive to their child's interests and are able to appropriately scaffold their learning, the close relationship between them and their child provides many opportunities for quality literacy activities. Incorporating multisensory stimulation into parent-child interactions with print may provide a simple and effective way for young children to learn about print in a fun way. For instance, when a parent begins to read a storybook to their child, they might look at and point to a letter on the title page (visual), say the letter's name and sound (auditory), write the letter in the sky (kinaesthetic), and then trace the letter with their finger (tactile) while repeating the letter's sound. Explore letters on a child's favorite food packaging, toy label, or sign using these four steps—point, say, move, and trace. The scaffolding provided by this multisensory approach will no longer be required for that letter as the child masters it. As a form of self-scaffolding, young children may also adopt these multisensory strategies to explore and learn about letters, words, and other forms of print like numerals. During child-initiated writing activities like labeling drawings or copying printed labels from food or toy packaging, tracing letters with fingers and forming letter shapes in the air may also assist children in writing letters and words on paper.

The simultaneous processing of multiple types of sensory information is a common experience that may improve learning and memory, according to behavioral, neuropsychological, and neuroimaging research. Multisensory integration is thought to occur at multiple levels in the brain. However, there are still a lot of unanswered questions about how young children develop multisensory integration and what kinds of multisensory environments and experiences might enhance learning. Although the visual, auditory, kinaesthetic, and tactile sensory systems appear to be connected, more research is needed to determine the precise nature and operation of this cross-modal association. Additionally, there is a lack of empirical evidence regarding the efficacy of multisensory approaches in both educational and domestic settings. During the early stages of brain development, it is also highly unlikely that all sensory modalities will contribute equally to learning. For instance, it has been discovered that young children frequently prefer auditory to visual stimuli. Multisensory teaching and enrichment strategies in educational and home settings require empirical investigation and validation. In

addition, there is a specific need to clarify the role that the tactile and kinaesthetic components of multisensory programs play in the process of literacy learning, despite the fact that learning to read is crucial. There is also a lack of knowledge regarding the process of audio-visual integration. To determine which modality combinations (visual-auditory-kinaesthetic-tactile) and multisensory activities produce the best learning outcomes for normally developing children in preschool and home settings, methodologically sound interventions that include appropriate control groups and pre- and post- assessments of a variety of early literacy measures are required. A randomized control study in which children are randomly assigned to either an auditory-visual program or a program with the same auditory-visual activities but with an added kinaesthetic-tactile component for letter learning could be used to test this.

The development of novel strategies to improve young children's early literacy knowledge will be aided by gaining a deeper comprehension of the functions that multisensory processing and instructional strategies play. Many educators believe that "hands-on" multisensory experiences that involve the manipulation of objects are powerful teaching tools, despite the fact that there is relatively little empirical research investigating multisensory methods in early literacy learning. However, in addition to employing ecologically valid real-world settings, it is essential to investigate multisensory integration in laboratory-based experiments in order to ascertain the specific advantages of multisensory methods. As a result, more research is required to determine the effectiveness of multisensory approaches' tactile-kinaesthetic component. This work may help improve our understanding of how to maximize young children's early literacy development and provide the necessary link between brain research and educational practice.

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