

Physical literacy: Fostering foundational literacy in early childhood education

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It is important for kaiako to have a strong understanding of how language and literacy can be introduced to children while they engage in physical movements that are a part of their daily routines and play experiences. Kaiako can intentionally support children in their development of pre-literacy concepts while children are spontaneously engaging in their play. In fact, it is considered that the development of pre-literacy skills and knowledge of literacy is foundational to the literacy activities that the child will be expected to engage in their primary education (Martineau, 2017). This article will look at how kaiako can foster pre-literacy skills by purposefully setting up environments that invite language and literacy development in holistic ways through emergent play in early childhood education, linking physical (tinana), cognitive (hinengaro) and language (kōrero) dimensions.

What is pre-literacy?

Pre-literacy incorporates any concept or skill that can foster the development of language and literacy (Machado, 2016). Infants and toddlers act upon the environment using their whole body in response to the environment, which creates mental images that later turn into verbal labelling and speech (Machado, 2016). Therefore, interactions between the child's inner capabilities and the environment influence and support the development of language and literacy.

Te Whāriki: He Whāriki Mātauranga mō ngā Mokopuna o Aotearoa: Early Childhood Curriculum (Te Whāriki) identifies that language is one of the pivotal learning areas of a child's development (Ministry of Education [MoE], 2017). Alongside identity and culture, language is most enhanced in early childhood settings when kaiako are responsive, recognising the critical window in the tamariki development (Berk, 2018; MoE, 2017). According to *Te Whāriki* "one of the major cultural tasks for tamariki in the early years is to develop competence in and understanding of language" (MoE, 2017, p. 41). Therefore, developing language and literacy skills is one of the most important aims of the early childhood curriculum (Ihmeideh, 2015) and crucial for kaiako to consider when teaching. While there is a lot of information about the social interaction with language development, there is however, not so much on how children learn language as a result of a focus on their physical development and movement (Kovach & Da Ros-Voseles, 2011, as cited in Otto, 2018).

Literacy and movement

Before formal instruction in writing or reading can happen, tamariki need to learn a multitude of skills and concepts (Schickedanz & Collins, 2013), which in early childhood can be facilitated through physical movement and body language. Minton (2003) explains that "ideas and feelings expressed in words actually begin in the body and that before you write or speak, there is a physical response" (p. 37). The neurocircuitry or neural pathways that underpin literacy are created during sensorimotor, cognitive and linguistic development (Roessingh & Bence, 2018). The comprehension of language therefore happens before speech or visible actions (Berk, 2018; Santrock, 2017).

Comprehension is the ability to understand. Comprehension can be viewed through multiple lenses including the physical, sensory, visual, and listening or audio comprehension (Enz & Mandel-Morrow, 2009), and these are how infants begin to understand and build their knowledge (Santrock, 2017). Ionescu and Vasc (2014) and Kiefer and

Trumpp (2012, as cited in Roessingh, & Bence, 2018) concur, pointing out that “language is crucial to the creation of meaning” (p. 244) with spoken language first, and written language to follow. Piaget suggests that in the sensorimotor stage, infants “organise and coordinate sensations with physical movements” (as cited in Santrock, 2017, p. 168). Lakoff (1987, as cited in Haggerty & Mitchell, 2010) adds that physical experiences in infancy create the foundation for the concepts needed for literacy, which occur when infants are given space to move freely. This aligns with Pikler’s and Gerber’s approach to play and freedom of movement (Sandilands, 2016). During the sensory stage, very young tamariki, including infants, experience literacy concepts holistically with their whole bodies (Franzén, 2015; Nell, Drew, & Bush, 2013).

Pre-literacy concepts in physical movement

As infants, toddlers and young tamariki acquire bodily awareness through the development of large muscle movements first, large whole body movements can be described to give meaning to prepositions like; in, under, over, through, in front, behind, above and below. This will support tamariki to use these words to support early mark making and then writing. When tamariki physically engage with playground equipment to go *down* the slide, *inside* the boxes, *through* the tunnel, and *over* the logs, kaiako can use these words to describe the children’s actions. Hence words become more meaningful and form the foundation knowledge for mark making in writing and in learning the formation of writing letters. For example, when a kaiako describes to a child how to form the letter ‘t’, she might say the letter ‘t’ is down and then across at the middle. A prerequisite here is that the kaiako uses expressive language while tamariki are engaging in the actions. Obstacle courses for example, can provide a perfect opportunity for kaiako to promote an understanding of prepositions (Pica, 2010).

Another concept is that of visual literacy, which includes an understanding of “action-orientated knowledge” (otherwise known as ‘perceptual motor skills’), for example, concepts such as middle, “long, longer, big, little, high, low, above, below” (Santrock, 2017, p. 166). Otto (2018) explains that pragmatic knowledge, where language is linked to physical knowledge, for example: “a shape of a circle is the same as a hula hoop’s shape” or: “the letter ‘a’ is a circle and a stick” helps children develop a physical memory of writing conventions. This includes a sense of directionality and knowledge of the shape of letters (Roessingh & Bence, 2018). Play based settings that encourage free physical play provide opportunities that foster various physical experiences and give occasion to visual representations. This is where kaiako can spontaneously, yet intentionally, facilitate and scaffold tamariki with language by describing their moves, allowing verbal mapping to occur (Otto, 2018). An example of verbal mapping might occur when kaiako are helping toddlers to balance across the obstacle course, talking with the child about what they are doing, speaking or naming their actions (Kovach & Da Ros-Voseles, 2011, as cited in Otto, 2018). This is also seen in the respectful practices as advocated in the Resources for Infants Educators (RIE) approach where kaiako explain to young infants what they are doing as they are doing it, for example by telling them: “I’m going to take your socks off and then your pants” (Sandilands, 2016), which also develops a sense of sequencing.

Literacy development in all age groups

Kaiako can support language development by setting up the physical environment specifically to foster language and literacy experiences (Otto, 2018). McLachlan, Nicholson, Fielding-Barnsley, Mercer and Ohi (2013) recommend making the most of a literacy-rich environment by introducing a wide variety of resources, support quality interactions and teaching strategies such as co-construction, scaffolding and guided participation. Kaiako can also promote ‘active listening’ to offer tamariki further opportunities to expand on their explanations, resulting in a rich conversation (Hawkes, 2015) and fostering opportunities to learn new words.

As tamariki play outdoors, they have the opportunity to develop large motor skills; playing with objects of different weight and size develops strength in the hands, arms, back, neck, and chest needed for writing (Harte, 2018; O'Connor, 2011). Offering fine motor activities using real life materials and objects such as tweezers and beading for older tamariki and ribbon and scarf play for babies, is also important for literacy development (Rule & Stewart, 2002 as cited in Roessingh & Bence, 2018) and can ultimately support pencil grip and pencil control (Keifer, 2015).

Another physical experience that is extremely important for literacy development is that of rotation. This develops the 'vestibular system', which is a multifaceted structure situated in the inner ear (Curtis, 2018). Its function is to send information to the brain regarding motion and 'spatial orientation' including balance and equilibrium. The vestibular system's important function is to coordinate sensory information to maintain attention and focus (Connell, & McCarthy, 2014; Curtis, 2018). When a child spins around, their brain is connecting information from various parts of the body, such as the tendons, muscles and eyes (O'Connor, 2011). Spinning on a swing, rolling inside a tunnel or hanging upside down, supports the child to comprehend body movement and space orientation (Curtis, 2018; O'Connor, 2011). This is important learning that helps tamariki with eye tracking and being able to follow the same line when reading and writing (Connell & McCarthy, 2014). In early childhood care and education centres, kaiako can provide opportunities for tamariki to swing and spin on hammocks, swing chairs, gymnastic rings and spinning equipment.

While there are many other concepts and strategies within pre-literacy skills, the following attempts to collate some examples of how kaiako can foster pre-literacy skills in outdoor environments.

Language & literacy concept/ learning outcome	Activities/experiences / equipment	Kaiako strategies
Prepositions and action orientated knowledge	Obstacle courses, climbing equipment, any play involving whole body movement Free movement for infants	Verbal mapping
Eye-tracking Crossing the 'mid-line'	Catching a ball Spinning and swinging Hitting a ball with a bat Hitting a balloon or ball on a string	Counting: "Ready, steady..." Pointing / modelling
Phonics: Letter-sound connection	Writing letters in the sand	Describing the shape and form of the letters
Exploring the shape and directionality of letters	Whole body movement/ walking over a long line/ shape Matching	Drawing shape or letter in the air (big arm movements), using the words big, small, across, angle, long, short, tall, round,

		etcetera. same/different
Using words and symbols for meaning	Using arrows/signs and other symbols in the playground	Stop/go Left/right/direction
Connection between oral and visual language	Maps Going on a bear hunt	Straight on, back, in, out Narrating
Sequencing	Turn taking Games in the playground, Duck, duck goose, Who's got the bone?	First, next, after Verbal mapping of care tasks
Spatial awareness Awareness of the body	'Shape' jumps (make a shape with your body)	Affirming the shapes that can be observed Infants having freedom of movement
Rhythm/ timing Syllables	Singing a rhyme on the swing Jump rope, hopping, clapping to the beat of the song, statues	Emphasis/tense/sound
Directionality	Obstacle course Spinning and swinging equipment Bike riding tracks, train/car tracks	In, out, over, under Up, down, round and round

Conclusion

Kaiako can seamlessly weave physical literacy throughout a multidimensional learning environment, within the daily curriculum in intentional ways, in a play-based setting. Having the content knowledge and understanding of the concepts which foster language development, supports kaiako to be able to spontaneously, yet purposefully extend and support infants' and young tamariki language and literacy development with intentional teaching practices within the emergent curriculum.

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