

Multi-Sensory Play in the Reading Classroom

Young children come to formal learning settings with blocks of knowledge upon which they can continue to build or redesign. Piaget's Cognitive Theory (1976) is one of the founding principles from which constructivist teaching/learning approaches are cultivated, acknowledging that knowledge is constantly linked with actions, and to learn one must displace, connect, combine, take apart and reassemble objects.



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As children enter formal schooling, the increased focus on standardising curriculum often comes at the expense of child-focused, developmentally aligned pedagogies such as play, which have been the cornerstone of early childhood education for over a century. Through play, children engage and learn within their optimum state, as their interest is kept, and their imaginations are inspired. So well recognised is this foundational understanding that the United Nations (1990) has included play in the Human Rights treaty in the sub-section, Conventions on the Rights of the Child. The convention, which is ratified by all but one country in the world, states in article 29;

Children's education should help them fully develop their personalities, talents and abilities

and article 31, which states;

Every child has the right to rest, relax, play and to take part in cultural and creative activities.

It is this innate desire to learn through play that makes it such a foundational piece to early childhood education.

Five Characteristics of Play

Play has several positive effects on children's learning and development, which are important to note when discussing play in a learning context. These are summarised by the following:

1. Play is non-literal and intrinsically motivated.

This means that the child's internal reality takes precedence over external reality as they begin to explore, interact and try to make sense of the new experience in relation to their current understandings and schemas. The play comes from within the player themselves, not from the teacher or others, and offers its own rewards to the individual.

2. Play is about the process.

Play is the process of doing and it is not working towards a predetermined outcome. The attention focuses on the activity itself, not the goal of the activity. In fact, the activity can be so engaging that there is no outcome achieved, rather it is a state of 'to be continued'.

3. Play involves free choice.

Pleasure and the ability to choose whether to engage or not at any point in the activity is a key factor in play. Children often drop in and out of play situations as their interest and pleasure ebbs and flows in the activity.

4. Play is an expression of freedom.

Play does not have externally imposed rules, may not have rules at all, and if it does have rules as determined by the children involved, they may change through the course of the play through active engagement.



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Children have the freedom to express themselves, their ideas, and the way they view the world through their play.

5. Play is a skill building process.

Skills such as practicing flexibility, persistence, resilience, and confidence are all built through play.

A review of these characteristics makes it clear that play is contextual, fluid, personalised and learner-centred. It is also evident that play is a child-initiated activity that does not necessitate an adult to plan and coordinate. Undoubtedly play can be a vehicle for learning but play in and of itself does not guarantee learning.

When educators intentionally use play as a vehicle for learning with a pre-determined goal or outcome in mind, this is often referred to as play-based learning or play pedagogy, and this is different to play in and of itself. Unlike a set curriculum which often has a standard sequence of pre-determined lessons to follow, play-based learning is an emergent process. Additionally, a standardised curriculum can be delivered in a playful manner, but this is not play-based learning. Play-based learning is created from observations of students and follows the lead of the learner in exploring the environment, concepts, knowledge and understanding through play. It is the role of the educator to support and facilitate the learner inquiry process and help them to make connections between existing knowledge/experiences and current explorations and findings. Educators who have a sound knowledge of content and pedagogy and who have their pedagogical foundations firmly planted in play, will provide experiences that hold great potential for learning that extends children's understanding and dispositions (Dockett & Perry, 2010). This can be done in all areas of the curriculum, including the teaching of language arts, and reading.

Playing to Support Reading Development

Not only being able to read but understanding what you are reading is one of the main goals of lower primary education globally (Soliman & Al-Madani, 2017). How do we connect beginning reading skills to real-world reading? The best way is through play. Reading development initially begins with language development. More opportunities young children have to develop language skills increases the likelihood that young children will be able to learn beginning reading skills. Language and literacy are intertwined. How young children acquire language and beginning reading skills matters. When children learn through play, there is a greater chance that they are engaging in multi-sensory activities, and through these activities children's brains are more likely to process new information into long-term memory (Birsh & Carreker, 2019). Children need to interact with each other through prolonged periods of uninterrupted free play as it is important for socialisation, which in turn exercises and builds language skills (Mielone & Paterson, 2009).

In addition to uninterrupted free play, educators can develop activities that are play-based and work on beginning reading and language skills. There are four theorists (Maria Montessori, Jean Piaget, Lev Vygotsky, and Brian Cambourne) who have studied the relationship between literacy development and play. All of them concluded that when children experience the world around them in a hands-on way, they are more likely to learn from the experience (Mooney, 2000). Silva (2021) agreed it is essential for the overall development of a child to include play in all that they do. Core areas of education are not excused from this notion. Playing can enhance and increase material retention especially in literacy. When literacy is being learned through play it can help children become more

interested in learning reading skills. It can also help sustain interest for future learning. Many children need convincing that reading skills are enjoyable. Educators need to show children that reading is enjoyable. Using play as an avenue can help increase and sustain interest. Lastly, when children learn to read through play, educators are promoting healthy brain development.

Recent Research

According to Stetkevich (2020), recent research surrounding dyslexia and structured literacy support using multi-sensory instruction as a hands-on approach for literacy instruction shows that it is an effective overall learning approach for all children, but especially for students with reading difficulties (Waterford, 2019). Research on multi-sensory reading instruction used to be conducted by psychologists, educators, and neuropsychiatrists, but much of the research has been taken over by neuroscientists and is being conducted on and about the brain using magnetic resonance imaging (MRI), functional magnetic resonance imaging (fMRI) and computed tomography (CT) scans.

Sweller (2020) pushes the notion that reading is not a primary brain task. A primary brain task is one that can be easily completed with hardly any conscious effort. As humans we make an effort to learn to read as it does not come naturally. For some the task of reading comes more easily while others will need to get creative through various approaches to make reading accessible. When we understand that literacy tasks do not come easily to all due to brain differences, we can begin to implement a variety of approaches for more meaningful learning (International Dyslexia Association, n.d.). Spear-Swerling (2018) found that deficiencies in comprehension, decoding, and phonemic awareness can be strengthened through interacting with multi-sensory activities. In addition, Rusinko (2011) found that when an activity is multisensory it can add in a kinaesthetic aspect. Adding a kinaesthetic element helps to activate prior knowledge, which can increase an individual's working memory and make learning more meaningful.

Those that are currently researching are continuing the ground-breaking work of Montessori, Piaget, Vygotsky and Cambourne by confirming much of their work and expanding upon their principal discoveries. Many different teaching approaches have been developed from their research and the effectiveness of these teaching approaches continues to be studied today. The Montessori Method, Wilson, Orton-Gillingham, Reggio Emilia, and Barton are all approaches that have aspects that are hands on and multi-sensory.

While many of them were not recently developed, they have stood the test of time and meet current research findings.

Multi-sensory Approach

Multi-sensory instruction has proven to be extremely effective for children with dyslexia and other reading difficulties (Hudson, High & Al Otaiba, 2011). A multi-sensory approach to reading is based upon dual coding theory where both verbal representations and mental images are being activated at the same time, which increases the likelihood of new information being stored in long-term memory versus short-term memory (Schlesinger & Gray, 2017). It involves activation of more than two senses (auditory, visual, tactile-kinaesthetic, and/or articulatory-motor) at one time. A multi-sensory approach is also known as VAKT (visual-auditory-kinaesthetic-tactile). This approach integrates sensory activities. Students hear, touch, see, and use movement. At least two need to be activated at one time to make an activity multi-sensory. Most early literacy areas lend to easily adapting activities into multi-sensory activities. A study conducted in 2018 used fMRI technology to study learning preferences and found that those who used a multi-sensory approach to learning had the strongest literacy skills (Smith et al., 2018).

Addison et al. (2012) discussed how active reading (predicting, connecting, questioning, evaluating, clarifying, and visualising) is multi-sensory as students will need to activate their senses to engage with text material. When students are participating in this type of multi-sensory instruction, they can interact with the world around them in multiple ways. A multi-sensory approach can be used for word identification, phonemic awareness, phonological awareness, phonics, fluency, comprehension, and spelling. Multi-sensory activities can be easily differentiated to meet students' learning needs. They also lead to opportunities to scaffold instruction. Within early literacy, multi-sensory learning can assist students in connecting print letter with the oral alphabet. This is one piece of early literacy that can be difficult for many but using a multi-sensory approach gives students a better chance of retaining material. This approach allows students to use their whole brain and tap into more meaningful learning opportunities.

Kinaesthetic & Multi-sensory

Early childhood educators have always known that movement is essential and that incorporating movement into the daily learning experiences is the most developmentally appropriate approach to working with young children. In Queensland this was evident

between the late 1970s through to the early 1990s, when the educators within public education services were provided with the autonomy and professional respect to develop their own curriculum, delivered through play pedagogies. A foundational aspect of these preschool and early primary PE classes were perceptual motor programs which could be found in most schools during that period. Perceptual motor programs connect children's perceptual or sensory skills to their motor skills, enhancing and promoting their development (Clark, 2007). This is important because movement and sensory skills are important to learning. Perceptual motor development refers to one's ability to receive, interpret and respond successfully to sensory information (Capon, 1975).

With the increased pressure to perform on standardised testing such as the National Assessment Program – Literacy and Numeracy (NAPLAN), this program is no longer commonplace in Prep through Grade 3. However, a study in 2018 found that how play was enacted in teachers' day to day practices varied, however all were taking steps to move away from traditional didactic teaching methods to deliver more physically active learning experiences (Riek, 2018). This is important as research has shown that movement is essential for students to learn as it builds neural pathways and thus influences academic achievement (Kleinjan, 2020; Stevens-Smith, 2016; Archer & Siraj, 2015). Embracing a kinaesthetic and multi-sensory approach to teaching, which focuses on perceptual motor development, is fundamental for developing the visual and auditory discrimination essential for reading development.

The Importance of Crossing the Midline

The midline is an imaginary line that divides a person, from head to feet, right down the middle. It divides the body into the left side and the right side. You cross your midline when you reach across your body from the left side to the right side and from the right side to the left side. When the midline is crossed during an activity it means that both sides of a student's brain are being used. Crossing the midline helps strengthen a child's dominant side, while still using their less dominant side. Simply crossing the midline is important, but educators can be purposeful in how they have students cross their midline to reap the largest benefit. The best way to get the full benefit is to move in a figure eight motion from left to right or right to left. Crossing the midline will help to fine tune and strengthen fine motor skills. From a very young age children cross their midlines while learning to follow an object, playing with their feet, and reaching for toys. For school-age children, educators need to

purposefully develop activities that are going to cross the midline and use their whole brain. If both sides of a child's body are left to work independently all day long, over time it can lead to poor communication between the left and right hemispheres of the brain (Blackmore, 2021). Educators need to make sure that a child's whole brain is being utilised so that they can learn to their full potential. Students who have difficulties crossing their midline often have difficulties with reading and writing. While educators can integrate midline activities into their daily routines, sometimes an occupational therapy may be needed (ABC Paediatric Therapy Network, 2021). Activities such as drawing, cutting, completing puzzles, scissors and reading can be activities that utilise crossing the midline. In fact, most activities that are hands-on, multi-sensory, and play-based can do this.

Teaching Approaches and Programs that Work

Educators today have a multitude of approaches they can select to use in their classrooms. Not all approaches are created equal and not every child learns the same way. When selecting approaches educators need to critically look at several factors, including: Who are their students as learners? Are students above, on or below learning targets? What are the learning goals for the year? And what type of progress needs to be made for each student to meet the learning goals? There is one teaching approach that is multi-sensory in nature: Orton-Gillingham. There are two programs that use Orton-Gillingham at the core of their philosophy and practice that are noteworthy, Wilson and Barton. What is great about all three is that they can be adapted to a student's current learning needs and provide them individual differentiated instruction that is multi-sensory and kinaesthetic. While the Orton-Gillingham approach is the most effective for many students, it requires a highly trained Orton-Gillingham educator. Wilson requires less formal training and Barton requires even less, making them accessible for the general education classroom setting.

Orton-Gillingham is a multi-sensory approach that has been shown to benefit students with dyslexia, as well as students with other reading difficulties and the general education student. Orton-Gillingham is a "direct, explicit, multi-sensory, structured, sequential, diagnostic, and prescriptive way to teach literacy" (Orton-Gillingham Academy, 2018). It is considered a structured literacy approach. Orton-Gillingham teaches students to make connections between letters and sounds. It teaches students to break down reading and spelling concepts into smaller skills that are more manageable. These skills typically involve letters and

sounds, and the skills build over time. This approach teaches reading at the word level, meaning that students break words down into patterns and learn rules about each morpheme and grapheme. Due to this, students are taught how to decode and understand how words function (Rosen, n.d.a). This approach takes all the senses and combines and applies them to reading instruction. For instruction to be considered consistent with the Orton-Gillingham approach, a minimum of three senses must be combined within a learning activity. Most other multi-sensory approaches only combine two senses. At least one of the senses needs to be tactile or kinaesthetic in Orton-Gillingham instruction. Teachers also need to make sure that the activities in which students are engaged will encourage students to cross their midlines, as that promotes whole brain activation (Stevens et al., 2021). Orton-Gillingham is structured in a way that each skill must be mastered before moving onto a new skill (Rosen, n.d.a). This ensures that students are fully understanding concepts and not creating holes in their learning.

Wilson uses the highly structured Orton-Gillingham approach but uses more simple and direct materials. It uses visual, auditory, kinaesthetic, and tactile senses to help students make connections between sounds and words. Through a unique sound-tapping system, students learn to break down and blend word sounds by tapping out each sound with their thumb and fingers. Wilson uses fewer visual cues than other Orton-Gillingham programs. This is to help students focus on decoding words without the distraction of visual cues. Sessions of this program are typically longer than other Orton-Gillingham based programs, as they tend to range between 60-90 minutes. This is because each lesson covers ten skills. One way these programs keep a student's attention is it encourages them to read and write about their own interests. This program has material for kindergarten through high school, making it available to many learners (Cunningham, n.d).

Barton, like Wilson, is Orton-Gillingham influenced. This approach is still structured, explicit, sequential, and multi-sensory but it is less so than Orton-Gillingham and Wilson. Barton is extremely scripted to allow for non-professionally trained individuals to administer the program making it more widely accessible. Each lesson comes with a video for the instruction on how to teach the lesson and trains the program administrator on the go. This program also offers free online and phone support to assist those giving the instruction because the lessons are so scripted and structured there is little room for error.

While all these approaches and programs focus on spelling, Barton spends an extensive amount of time on spelling, claiming that it is to help with vocabulary. One huge difference between Orton-Gillingham and Barton is that Barton has students memorise reading and spelling rules where Orton-Gillingham does not (Rosen, n.d.b).

Learning Activity Examples

Here are some easy to do learning activity examples for Prep, Grade 1 and 2. These have been used by the authors both here in Queensland and the United States to incorporate multi-sensory and movement into learning experiences for young children.

Tapping body spelling/phonemes

In this experience students can tap different parts of their body as they break down the word into syllables or the sounds. This can be modified from whole body tapping to just finger tapping if you are restricted on space for children to get up and tap their bodies.

Finger tapping spelling/phonemes

Have children make a handprint on a piece of A4 card. This can be laminated for longevity of use. Placing their hand on the copy of their handprint, learners can then tap different fingers from left to right to tap out syllables, sounds, and/or spelling.

Air-writing

A great activity to promote crossing the midline is using big arm movements as students write the letters of words in the air. This helps children to practice writing the letters in the correct motions so they can transfer these skills to their writing on paper.

Whole group body spelling

In this activity students need to work together to use their bodies to form the letters to spell the word. This requires students to work cooperatively with each other, sometimes on the same letter, so that they can consider how the letters are formed and in what order to make the word.

Hopscotch spelling

This is a great full body movement game for students to practice their spelling, particularly with word families. Set up a hopscotch board. In each square put a word. Students then toss a beanbag or something similar, onto the hopscotch board. Student hops to the identified square, says the word, spells the word and then says it again; and then hops back to the starting point. This can be repeated for as long as they want to play.

Rob the nest

This is a game played by four students at a time and

can be played to either make a sentence or a word. Each student starts with their nest full of 8-10 random letters/words. It is the aim of the game for them to rob the nest of their peers, so they have enough letters to make a variety of words or enough words to make several different sentences. The person with the most words/sentences at the end wins.

I Spy

This is an oldie but a goodie. This is a great one to share with families so they can play this with their children as it can be played anywhere. While it can be played in the traditional way by providing students with the first letter of the object as a clue, it can be played by instead providing the onset or rime of the object, or the first phoneme of the object, or a word that sounds like the object as a clue.

ABC Chip Game

In this game 2-4 players will try to complete the alphabet together. This can be done at school or at home. It is a great way to get students engaged with their ABC's in print while still playing a game. To begin, the whole alphabet will need to be displayed on weighted chips (I use poker chips with ABC labels). Weighted chips are needed to ensure the activity is multi-sensory. Each player is doled three to four chips depending on how many are playing. Three to four

chips are placed in front of the players in alphabetical order (this makes the game board). The remaining chips go into a pull pile. In clockwork order, take turns placing your chips on the board in alphabetical order. You can only place a chip if it can connect to one on the current board. If you cannot, your turn is skipped. Each time that a player places a chip they will need to say the name of the letter and its corresponding sound. When strings of letters begin to be built at the end of each turn, the player should point to each letter in the string and say the letter name and sound. When you place a chip on the board, pick up another from the pull pile until they are all gone. You can do this with the whole alphabet or with just a portion.

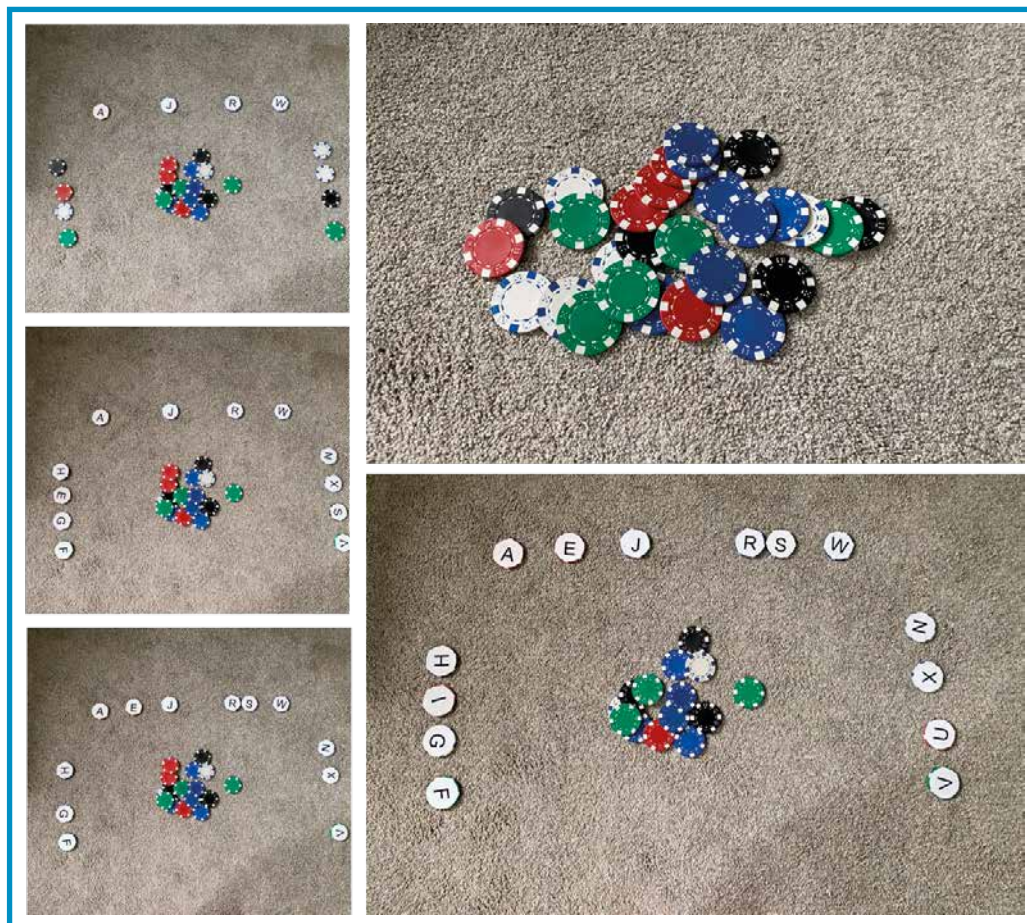
Figure eight spelling

This activity helps turn spelling into a tactile and hands-on event. For this activity you will need two students and one object that can be passed between them, such as a squishy ball. You will give them a word to spell and as they spell the word, they will pass the ball back and forth in a figure eight pattern making sure that their hand and arm cross midline. Have them repeat each word four times alternating who begins

each time. Both should be spelling the word each round.

Tactile letter and word creating

A great hands-on activity is to use Wiki Sticks, pipe cleaners, Playdough or clay to create letters and words. In addition to being hands-on, this activity will help increase fine motor skills. For letters, students can practice identifying and connecting letter sounds. For whole words, students can practice breaking them down into morphemes, base/root words, digraphs, blends, and syllables.



Tactile writing

Writing does not always need to be on paper. Through this activity students will write on various tactile surfaces. This activity can help with fine motor control as well as sensory. If you have a student who has sensory processing disorder, make sure that they can handle each of the tactile surfaces. You will want to gather several tactile surfaces such as sand, felt, shaving cream/whipped cream, or sandpaper. Have students write individual letters and say the same and corresponding sound or have them write full words spelling each word as they write each letter. Encourage midline crossing to activate using the whole brain.

Building words with pegs

For this activity you will need many pegs with lower- and upper-case letters written on the ends of the pegs. Each peg will have an upper-case letter on one side and a lower-case letter on the other. Punctuation clips can be added as appropriate. In addition, you will need a ruler or other flat surface to attach the pegs to. Students can be given a list of words to build, or they can have the freedom to spell on their own. When students are ready, they can move on to building whole sentences.

Pom poms and pegs

A great multi-sensory fine motor activity is having students sort pom poms with pegs. There is a wide range of what can be put on the pom poms. Upper or lowercase letters could be affixed as well as whole words, digraphs, and blends. Students should always be encouraged to use both hands and cross their midline.

Conclusion

The role of the teacher in the learning process is crucial in guiding the students to make connections between their lived experiences within their play and the curriculum connections as mandated by the governing body. It is this crucial aspect that requires teachers to know their students as individuals so that they have a holistic view of not only their academic abilities, but also their interests, favourite activities etc. With this knowledge you can incorporate these aspects into your planning. When beginning to undertake a multi-sensory approach it is important to ensure you have all the materials required and set up ready at the beginning of the day, so you can hit the ground running and there is no lag time for students to lose their momentum in enthusiasm. Remember this is not a one size fits all model. Some students will be sensory adverse and as teachers you need to take this into consideration. If you have students that are sensory adverse, provide them with

alternative experiences which will meet their unique needs. Facilitating multiple opportunities, in multiple modes, for students to engage in learning and reading experiences throughout the classroom (and into the home/community) is important and embracing multi-sensory approaches such as the ones outlined here is a good place to start.

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