

Assessment of Children as Connected with and Contributing to Their World in Early Childhood Education and Care: Literature Review

Victorian Early Years Learning
and Development Framework

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The Victorian Early Years Learning and Development Framework (VEYLDF) aims to guide all early childhood professionals in their work with children and families. It sets out eight Practice Principles that provide a foundation for achieving the five nationally agreed Early Years Learning Outcomes (Early Years Learning Framework for Australia, Australian Government Department of Education and Training 2009).

The VEYLDF describes five Learning and Development Outcomes for children from birth to eight years, connecting the Learning Outcomes from the Early Years Learning Framework to the first three levels of the Victorian Curriculum Foundation–10 (Victorian Curriculum and Assessment Authority [VCAA] 2017a). The five Outcomes help early childhood professionals to plan for and assess children’s learning and development, and provide a common language to support collaborative approaches between early childhood professionals and families. The five Learning and Development Outcomes are:

1. Children have a strong sense of identity.
2. Children are connected with and contribute to their world.
3. Children have a strong sense of wellbeing.
4. Children are confident and involved learners.
5. Children are effective communicators.

This literature review is part of a series of reviews designed to assist Victorian early childhood professionals to implement the VEYLDF.

The primary focus of this review is supporting early childhood professionals to monitor children’s progress in relation to the Outcome *Children are connected with and contribute to their world*. As the Outcomes are closely related, it may also assist in monitoring progress towards other Outcomes. For example, a child’s connection with their world is closely associated with their identity, and sense of wellbeing, while the ability to contribute to their world is related to the development of effective communication and being confident and involved learners. Early childhood professionals are encouraged to read this review with children’s holistic development in mind.

The VEYLDF also includes eight Practice Principles to guide evidence-based practice:

1. Reflective practice
2. Partnerships with families
3. High expectations for every child
4. Respectful relationships and responsive engagement
5. Equity and diversity
6. Assessment for learning and development
7. Integrated teaching and learning approaches
8. Partnerships with professionals.

The content of this review will be used to inform the *Connection and Contribution Practice Guide*, which will provide practical support for early childhood professionals to use the findings of this review in their practice. This literature review introduces key concepts and tools that will be used to underpin the *Connection and Contribution Practice Guide*, thereby establishing a strong base of common knowledge and understanding that early childhood professionals can apply to their practice.

Executive summary

This literature review is one of a series of reviews to support Victorian early childhood professionals to assess children's learning and development in relation to the five Learning and Development Outcomes in the Victorian Early Years Learning and Development Framework (VEYLDF). The review focuses on the Outcome *Children are connected with and contribute to their world*. Its purpose is to provide a resource that equips early childhood professionals with the knowledge to identify and assess children's progress towards this Outcome in all early childhood education and care (ECEC) settings.

Section 1 unpacks the concept of children's connection with and contribution to their world from birth to eight years of age. It takes the concepts articulated in the VEYLDF Learning and Development Outcome and defines these concepts with reference to relevant research. The goal is to condense the many ideas of this VEYLDF Outcome into a simple conceptual model, starting with defining the child's world.

This conceptual model (Figure 3, on page 8) was developed using Bronfenbrenner's (1979) ecological model for child development, and situates learning in ever-widening circles of the child's world.

Section 1 also explores the difference between ecological models and environments, recognising that children also connect with and contribute to different environments. These different environments include built, natural and social environments as well as digital environments, which contain both built (technology) and social elements.

Through the conceptual model, this section examines the two concepts – or 'big ideas' – articulated in the Outcome: connection ('I explore my world') and contribution ('I shape my world'). The model's construct defines 'exploration' as orientation, curiosity and participation, and 'shaping' as decision-making, negotiation and responsibility.

This model is designed for early childhood professionals to use to organise their thinking in assessment, reflection and planning for children's learning and development.

Section 2 discusses principles for assessing children as connected with and contributing to their world. The following six principles have informed this review, and can be applied to inform early childhood professional practice:

1. Assessment addresses established components of children's connection with and contribution to their world.
2. Assessment enables early childhood professionals to describe a trajectory of development.
3. Assessment is valid, reliable and fair.

4. Assessment is conducted in a way that enhances engagement and relationships.
5. Assessment includes children's self-assessment.
6. Assessment involves the child's community and informs professional partnerships.

Section 3 identifies a range of tools that are available to support early childhood professionals in their assessment of a child's connection with and contribution to their world. These tools are summarised in a table.

In Section 4 each of these tools is described in more detail, with an overview, a description of the tool, and a brief discussion of its purpose and use. The following tools were selected for this review:

- Assessment Framework for Children's Human Nature Situations (ACHUNAS)
- Asset-Based Content Matrix
- Children's Voices
- Connectedness to Nature Index for Parents of Preschool Children (CNI-PPC)
- Desired Results Developmental Profile (DRDP)
- Mature Play Observation Tool (MPOT).

These tools can help early childhood professionals understand the dimensions of the Outcome *Children are connected with and contribute to their world* and how these dimensions may be measured. They provide early childhood professionals with common language and concepts that they can include in their observational assessments of children's learning. The tools selected have been validated to varying degrees, and most are accessible to and can be administered by early childhood professionals.

A key finding of this literature review is that there are relatively few contemporary tools available to measure this VEYLDF Learning and Development Outcome that are available to educators and that have been validated with culturally diverse populations.

This report also includes a glossary to support understanding of any unfamiliar terms, and a list of references to help early childhood professionals identify further reading to build their knowledge in greater depth.

Introduction

This literature review aims to support early childhood professionals in assessing children as connected with and contributing to their world, to support understanding of the VEYLDF Learning and Development Outcome *Children are connected with and contribute to their world*. The review assists early childhood professionals by breaking this complex Outcome into elements that can be observed in children's play-based learning. The VEYLDF defines this Outcome as having four key components:

- Children develop a sense of belonging to groups and communities and an understanding of the reciprocal rights and responsibilities necessary for active civic participation
- Children respond to diversity with respect
- Children become aware of fairness
- Children become socially responsible and show respect for the environment (VCAA 2017b).

Many early childhood professionals recognise these key components of learning as important in their philosophies and practice; but there are many elements within these components, which makes this a complex Outcome to assess. This literature review aims to build on the knowledge that early childhood professionals already have about the children with whom they work, and to provide research-based ideas and tools for describing the development of a child's connection with and contribution to their world more clearly and systematically.

To do this, the literature review explores this VEYLDF Learning and Development Outcome in the context of early childhood research. It identifies key concepts of the Outcome that early childhood professionals can use to help sharpen their observations and intentional teaching. It then reviews tools that early childhood professionals can use in their day-to-day work to assess a child's connection with and contribution to their world. The purpose is to introduce to early childhood professionals the evidence discovered through this review of the literature, so they can make informed choices about how they explore the impact of their programs on children's development in this VEYLDF Learning and Development Outcome.

The review begins by providing greater clarity about what being connected with and contributing to their world involves, and reviewing available research on how this Outcome develops during the early years. The purpose of assessment against the Outcomes in the VEYLDF is to monitor children's progress over time, not only to provide point-in-time observations. The systematic assessments of children's connection with and contribution to their world described in this review should therefore

help educators to take a developmental approach to assessing this Outcome, recognising that all children's developmental pathways will differ, especially for such a complex Outcome.

This review uses guiding principles for the assessment of children's connection with and contribution to their world to support early childhood professionals to select and apply the various assessment tools that are available. These assessment principles align with those in other literature reviews in this series. It concludes with a list of assessment tools identified in the research literature, which may give early childhood professionals ideas for their own practice.

The evidence base is still emerging about how to support children to connect with and contribute to their world and how to recognise and assess this development. By assessing children's learning in innovative, child-centred ways, early childhood professionals may not only enhance their own programs but also contribute to the growth of new practices in early childhood pedagogy and assessment. This literature review therefore aims to provide a starting point for ongoing professional dialogue and research in this area.

Section 1: How are children defined as being connected with and contributing to their world?

Section 1 sets out a framework for how children from birth to eight years of age can be defined as connecting with and contributing to their world. It starts by unpacking the concepts of ‘connection’ and ‘contribution’, including concepts set out in the VEYLDF and taken from research literature. The literature review relates to the four key components of learning that underpin the VEYLDF Learning and Development Outcome *Children are connected with and contribute to their world*:

- Children develop a sense of belonging to groups and communities and an understanding of the reciprocal rights and responsibilities necessary for active civic participation
- Children respond to diversity with respect
- Children become aware of fairness
- Children become socially responsible and show respect for the environment (VCAA 2017b).

For this review the many ideas in these key components of learning are represented by a simple conceptual model that early childhood professionals can use to organise their thinking about assessing and promoting learning.

The first step in developing the model is defining a child’s world. The VEYLDF does this by referring to groups and communities to which children belong, and the environments and the world in which they live. It also notes that children have ‘a right to belong to many communities’ (VCAA 2017b). These communities may refer to local communities (for example, an early childhood or school community), communities of interest, or cultures that may be national or global in scope.

Bronfenbrenner’s (1979) ecological model for child development is probably the best-known illustration of this idea of multiple communities (Figure 1). It shows the individual located within widening circles: microsystem (such as family), mesosystem (mediating layer), exosystem (broader influences, like the media) and macrosystem (‘big’ ideas, like culture). This model was simplified for Victorian early childhood professionals in the Victorian Early Years Learning and Development Framework (VCAA 2016, p. 5); see Figure 2.

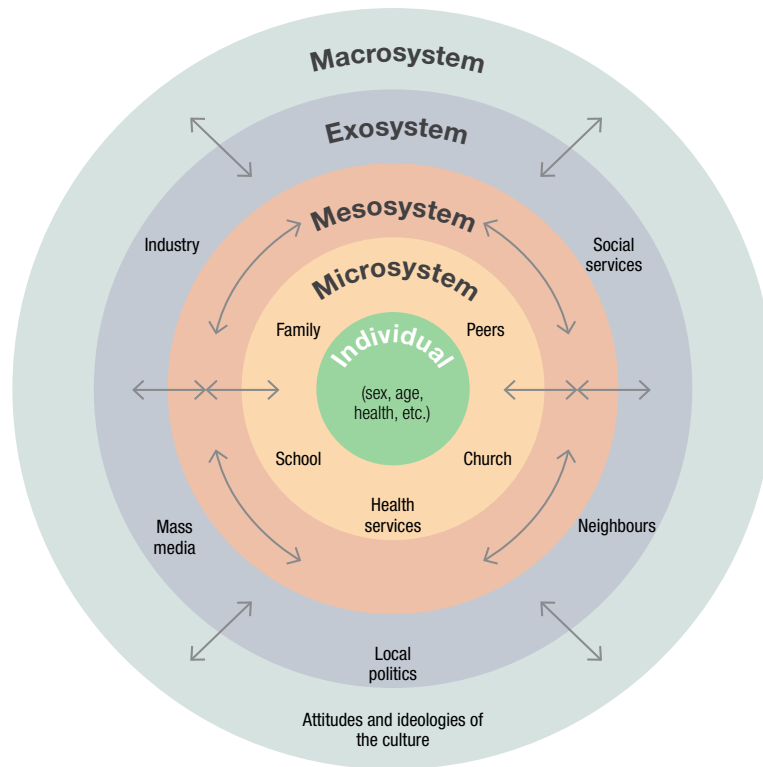


Figure 1: A representation of the ecological model of child development, as explained in Urie Bronfenbrenner 1979, *The Ecology of Human Development: Experiments by Nature and Design*, Harvard University Press, Cambridge, Massachusetts.

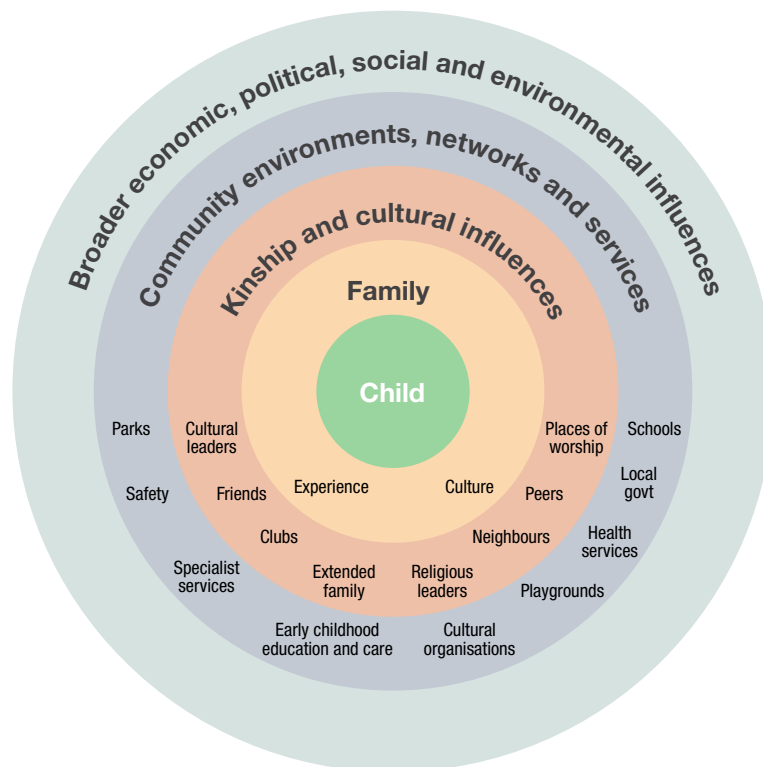


Figure 2: A modified version of the ecological model of child development

This model of early childhood development can be further simplified to support understanding of the concepts in his Outcome (Figure 3).

As in the first two models (Figures 1 and 2), this conceptual model situates learning in the ever-widening circles of the child's world.

- **Me:** The child is central, and their interactions and influences in relation to their different contexts can be mapped (this is the main purpose of the original model by Bronfenbrenner).
- **My family:** The first concentric ring surrounding the child shows the family – those who are responsible for the child – as the primary influence on the child's learning and development.
- **My community:** This ring includes the child's close community, which can be defined as friends, neighbours, ECEC settings, school and other children's services. It also refers to highly significant and familiar natural and built environments, which for some children might include homes, a park or Country.
- **My world:** The outer ring represents the wider world, which can be defined as including influences and institutions beyond (but linked with) a child's community, such as media and communications, social services, the natural world, and political, cultural and commercial structures.

The difference between this conceptual model and the examples in Figures 1 and 2 is that this model encourages early childhood professionals to further consider the Outcome's two 'big ideas' or concepts: connection and contribution. Each of these two concepts can be further considered using two statements about what children know and can do: 'I explore my world' (connection) and 'I shape my world' (contribution). Each of these big ideas itself also contains many aspects of children's learning and development. This review has identified three components for each concept:

- connection – orientation, curiosity, participation
- contribution – decision-making, negotiation, responsibility.

Becoming familiar with these components of connection and contribution can be useful for early childhood professionals. This review explores what each component involves and how educators can recognise it in assessing a child as connected with and contributing to their world.

Early childhood professionals may be able to suggest other conceptual models for each statement – or they might have a different model in mind for how they fit together. This review does not aim to provide a single, authoritative model, but simply to suggest an approach on which researchers and professionals can build.

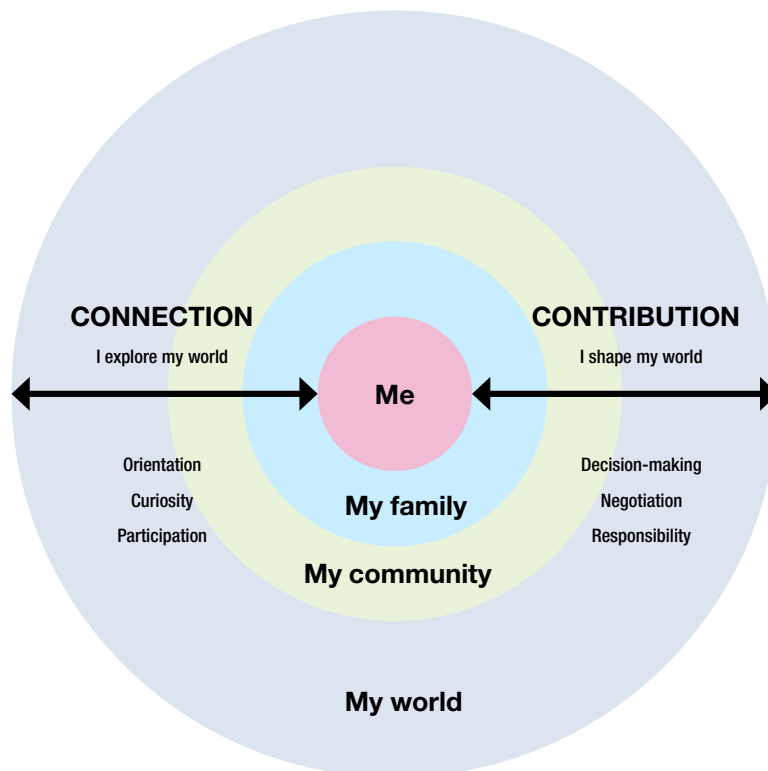


Figure 3: A conceptual model of children as connected with and contributing to their world

The difference between an ecosystem and an environment

The Bronfenbrenner ecological model could be described as an ecosystem that is limited to what a child already knows about their world; however, this is not the only way to think about a child's world. Another way for early childhood professionals to organise their thinking about this Outcome is to consider the different environments in which children exist. Built, natural and social environments all contribute to children's learning and development in distinctive ways (Ruiz, Quackenboss & Tulve 2016). Today's children also participate in digital environments, which contain both built (technology) and social elements.

Further details of each environment follow, to encourage early childhood professionals to think about the different spaces in which the various components of the ecosystem model might be demonstrated.

Each of the following environments can be considered in relation to each of the elements of the ecological model, at a personal level ('me' and 'my family'), a local level ('my community') or a global level ('my world').

Social environments

Social connectedness has been defined in many ways, but definitions tend to focus on socialising, social support and a sense of belonging (Frieling, Peach & Cording 2018). A popular description of social connection is 'the energy that exists between people when they feel they are seen, heard, and valued; when they can give and receive without judgment; and when they derive sustenance from the relationship' (Brown 2010, p. 19). There is a significant overlap between social and digital environments, particularly for children growing up in cultures where social connection online is the norm (perhaps initially with family members who live far away, and later with friends).

Natural environments

Natural environments encompass all physical settings except those that are predominantly constructed by humans. Connection with and contribution to the natural environment is often discussed in terms of connection to nature or Country, and sustainability. This is sometimes described in research as the human-nature connection (HNC), which is psychological (an intellectual and emotional connection), experiential (the experience of being in nature) and contextual (for example, connection to specific Country) (Giusti 2019). Another term for this connection in the research is biophilia, which is defined as 'a positive orientation toward nature' (Rice & Torquati 2013, p. 80), and a biological need and drive by humans to affiliate with other living organisms (the natural world).

Built environments

Built environments refer to the physical characteristics of the constructed environment in which children play, learn and live. Connection to the built environment relates to how children understand, explore and navigate their immediate physical environments, and the attachments they form to objects and places. Object attachment refers to children forming attachments to favourite toys or resources (Bachar et al. 1998; Fortuna et al. 2014; Litt 1986), and is an example of children's connection to the built environment that may be familiar to many early childhood professionals. The built environment interacts with both the natural and social environments that children experience, as social environments are constructed in, and influenced by, built environments (Ittelson et al. 1974; Proshansky & Fabian 1987).

Digital environments

Children are engaging with others and their world through technology more than ever before, and often in ways with which adults are unfamiliar. Exploring how children use technology to connect and contribute is a growing area of research but it is still in the very early stages.

Connection

What is connection?

Connection refers to how a child engages with their world: 'I explore my world'. In defining connection, the VEYLDF focuses predominantly on social connections: belonging (to people, Country, place and communities); values, traditions and practices; relationships and shared experiences; and empathy; respect and awareness (DET 2016). The VEYLDF also emphasises the importance of children's engagement with natural and constructed environments (VCAA 2017b).

Many of these constructs overlap with other VEYLDF Outcomes, reflecting the interconnected nature of the VEYLDF. This review extends the idea of connection to 'I explore my world' in order to create a clear point of difference from how social relationships and a sense of belonging are described in the literature reviews on other VEYLDF Outcomes, especially *Children have a strong sense of wellbeing* or *Children have a strong sense of identity*. By thinking about connection as exploration, early childhood professionals are encouraged to think about the world as a place for the child to discover, rather than focusing on the well-known spaces in which the child is comforted and nurtured (a perspective that is more important for wellbeing and identity).

This idea of connection as exploration can be further defined by three concepts: orientation, curiosity and participation. These aspects of exploration refer to how a child conceives of and understands their place in the world, and their motivation to learn by exploring and becoming an active participant in that world.

Orientation, curiosity and participation can be observed in children from birth to primary school. When a child is physically or socially ready to explore their world, they begin to demonstrate orientation. When a child is interested in connecting with an object, a person or an activity, we observe curiosity. When they are motivated and confident in connecting with their world, this leads to participation.

Orientation

Orientation has multiple meanings that are equally applicable to children's learning and development:

- the ability to identify the position or direction of objects or points in space (Benton & Tranel 1993), for example, spatial orientation (or spatial awareness) and wayfinding (Blades 1997)
- a person's basic beliefs or feelings about a particular subject; the act of directing your aims towards a particular thing (Oxford Dictionary 2020)
- training or preparation for a new job or activity (Cambridge Dictionary 2020), which is applicable to early childhood in that children must orient themselves before, during and after transitions.

The first meaning relates to a child's physical sense of themselves in the world, and their ability to find their way in and explore their built and natural environments. Orientation in this sense is closely linked to spatial orientation and awareness, which starts to develop from birth (Poole, Miller & Booth Church 2006). Research shows that children explore and learn how to make their way by developing cognitive maps, or a sense of their environment based on places, things and connections (Proshansky & Fabian 1987). Developing and using orientation and navigation skills can grow the hippocampus, a part of the brain that plays a major role in learning and memory (Bohbot et al. 2012). Physical settings (the built and natural environments) can be particularly influential in the development of very young children, who spend much of their time engaging with the physical environment compared with the social one (Parke 1978; Weinstein & David 1987; White et al. 1976).

Orientation in relation to beliefs and values is closely linked to the VEYLDF Outcome *Children have a strong sense of identity*. As a child's personal and social identity evolves, a value system emerges. Different cultural environments provide different inputs that help to shape value systems, and children may instinctively – or may be encouraged to – question and co-create their values and beliefs, or their orientation. The VEYLDF Outcome explicitly addresses values relating to respect, children's rights, fairness, diversity, democracy, reciprocity and environmental sustainability (VCAA 2017b).

Finally, orientation can also be defined as a transitional process linked closely to children's sense of place and their ability to find their way (wayfinding). This is perhaps the meaning most frequently given to orientation in the context of early childhood, to explain and assess how children become comfortable with new environments, particularly ECEC settings, and the first year of school. Wayfinding is an especially important component of children's interaction with their built and natural environments, which early childhood professionals can support. Research shows that visual-spatial memory (used in wayfinding) is a strength of many Aboriginal children, which can be applied to other areas of learning and development (Rock & Price 2019).

Curiosity

Curiosity is a state of motivation associated with exploration, openness to new experiences, and willingness to engage with the unexpected (Kashdan & Silvia 2009). Curiosity enables children to learn, explore and become immersed in an experience. When a child is curious, they are aware and receptive to their environment, what is happening in it and what might happen next. Curiosity serves an important purpose in connecting with others, as well as with the natural and built environments. Many researchers refer to curiosity or interest interchangeably. While they are similar, curiosity tends to look to the future, while interest tends to refer to a current level of engagement (Silvia 2019).

Curiosity involves learning about consequences, and making critical evaluations about new experiences. Safely exploring social, natural, built and digital worlds helps children to learn about their likes, dislikes and boundaries. For example, the human need for connection and autonomy exist side by side, and development of both trust and mistrust (or scepticism) are necessary skills that enable people to both connect, and maintain their independence (Kegan 1982). Curiosity also relates to the development of resilience, as children are supported to cope with adverse circumstances.

In babies, curiosity refers to novelty preference (liking new things) and their level of interest in and engagement with objects or surroundings that are new and exciting. Curiosity in older children is evident in a range of exploratory behaviours, for example pointing, questioning, discussing, and touching or playing with objects (Fortner-Wood & Henderson 1997). Curiosity is often described as a personality trait, but there is research that explores how curiosity can be fostered by environmental factors, for example by being offered activities and settings that are meaningful (Shah et al. 2018).

Curiosity is critically important to a child’s involvement in learning (Kashdan & Silvia 2009). Research shows that students who are more curious achieve stronger academic results compared with their less curious peers (Hidi & Berndorff 1998; Schiefele, Krapp & Winteler 1992). Evidence also points to the impact of academically challenging environments on student performance, with curious students performing better in more challenging schools, compared with less challenging ones (Kashdan & Yuen 2007).

Participation

Participation is a term that is frequently used in ECEC settings but is understood in different ways. Often, it refers to social engagement, or children’s participation in games, cultural activities and communities. In the United Nations Convention on the Rights of the Child (United Nations General Assembly 1989) it specifically refers to a child’s right to freely express their views and have them taken seriously, as well as their right to religion, conscience, association and information (Lansdown 2010).

In recent decades a child’s right to participate in society has evolved. Several models have been developed to assist in conceptualising how children participate, and the extent of a child’s engagement and contribution. Arnstein’s (1969) ladder of involvement, developed for adults, depicts a ladder showing the degree of citizens’ power in determining decisions and outcomes. Hart (1992) adapted this ladder for children. Figure 4 shows the progression of children’s participation, from connection at the bottom of the ladder up to contribution on the higher rungs.

Young children’s participation in their world is largely dependent on how well the adults in their life perceive and acknowledge children’s rights and their ability to participate (Ailwood et al. 2011). Children can be agents of change when ‘educators are flexible and are working within a philosophy that hears the voice of the child’ (Robinson et al. 2019).

Researchers in other cultures have noted a more pronounced emphasis on the role of participation in children’s learning in many indigenous cultures. An initiative called Learning by Observing and Pitching In (LOPI) (Rogoff 2014) examined Indigenous American practices that emphasise the central role of participation in family and community life, as a primary driver of learning. According to Rogoff, Mejía-Arauz & Correa-Chávez (2015), this approach is not ‘just natural’ but is a highly organised system of community and family support of learning. While much of LOPI’s research is specific to indigenous communities of North and South America, researchers note that similar practices are prevalent in other non-Western cultures, with the role of adult guidance or direction differing across and within cultures (Coppens et al. 2014).

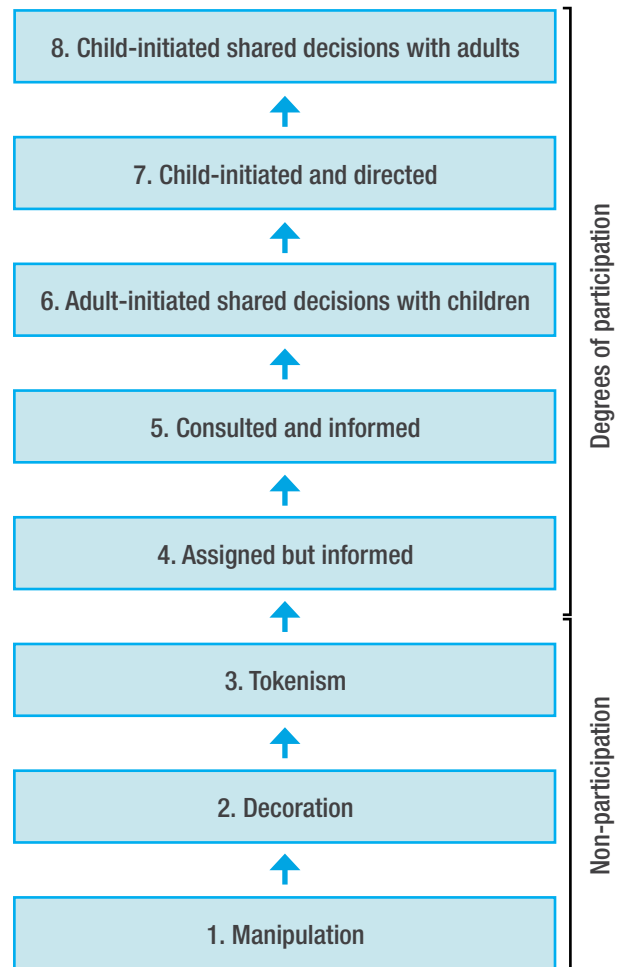


Figure 4: Hart’s ladder of young people’s participation, based on R Hart, 1992, *Children’s Participation from Tokenism to Citizenship*, UNICEF Innocenti Research Centre, Florence, p. 8.

Why is connection important?

The three components of connection (orientation, curiosity and participation) are deeply interrelated and fundamental to all aspects of children’s learning and development. Major theorists such as Piaget, Montessori and Werner stress that the interaction of the child with their environment is the basis of development. Research shows that the physical environment contributes significantly to the memories we form – shaping the way we see and understand the world – and to the development of personal identity (Chatterjee 2005).

As has been described in other literature reviews in this series, major theories of child development have a strong focus on the importance of relationships and connectedness (Bagwell & Schmidt 2011; Shonkoff & Phillips 2000). Warm and responsive relationships in the first years of life are believed to be the most important factor in healthy development and learning (Moore,

McDonald & McHugh-Dillon 2015; Tayler 2016), and social connectedness is a key driver of wellbeing, resilience and health (VicHealth, 2010). Recent research in neuroscience has established how our social experiences (positive and negative) are entwined with our biological processes, and therefore capable of influencing our health, particularly our mental and physical wellbeing (Eisenberger & Cole 2012).

A large amount of research also focuses on the beneficial effects of connection to natural environments for children's sense of identity and wellbeing, as well as for their academic performance (Faber Taylor & Kuo 2009; Maynard & Waters 2007; Nawaz & Blackwell 2014). Engagement with nature has been shown to improve psychological wellbeing and improve concentration and learning (Maller et al. 2006). Daily access to a natural outdoor area has been shown to improve motor skills, focus attention, reduce the incidence of illness, and increase imaginative and social play when compared with exposure to only human-made playgrounds with few or no natural elements (Fjørtoft 2001). Emerging evidence suggests that for Aboriginal children, teaching on Country and leveraging connection with culture and Country can positively influence their involvement in learning (Jackson-Barrett & Lee-Hammond 2018).

Less is known about the impact of connection in the digital environment on children's learning. While we know that children are accessing the internet, including with varying levels of social media use, at increasingly younger ages, there is limited evidence about the positive and negative impacts on learning and development, especially in early childhood (UNICEF 2017). As emerging research in this area generates new insights into children's digital worlds, early childhood professionals can also explore the impact of digital participation on children's learning in their own observations and assessments against each of the VEYLDF Learning and Development Outcomes.

Tools for assessing connection in the early years

As well as defining the components of the Outcome, this literature review also investigated what assessment tools are available to help early childhood professionals describe children's progress in these areas.

Currently there are a number of tools that measure elements of connection or connectedness. Many of these come from research in environmental psychology and measure children's orientation or connection to nature (Giusti et al. 2018; Musser & Diamond 1999; Rice & Torquati 2013; Sobko, Jia & Brown 2018). As this is only one aspect of the conceptual model used for this literature review, only three of these tools are investigated in detail. Sobko, Jia and Brown's Connectedness to Nature Index for Parents of Preschool Children (CNI-PPC) (2018) is a recent example of tools that are generally well designed and relate well to this Outcome, in particular the key component of learning 'Children become socially responsible and show respect for the environment' (VCAA

2017b). This tool comprises a 16-item scale that captures four major dimensions: enjoyment of nature, empathy for nature, responsibility towards nature, and awareness of nature. These are measured via a parent questionnaire. The tool also measures empathy and responsibility. Similar tools that are reviewed in Section 4 include:

- Assessment Framework for Children's Human Nature Situations (ACHUNAS) (Giusti et al. 2018)
- Asset-Based Content Matrix (Wilson, Mott & Batman 2004).

This review was less successful in identifying appropriate assessment tools for other aspects of a child's connection to their world. There are some classic and quite complicated tests that have been used in psychology to measure children's curiosity (Kreitler, Zigler & Kreitler 1975). These assess children's curiosity about images, objects or toys rather than curiosity in social situations, and involve measuring and comparing the length of time a child spends looking at simple images and complex images, and the intensity of their attention. Eye-tracking technology is enabling new tools that work in a similar way, although currently these are used only in specialist research settings (Sasson & Elison 2012). These tools were therefore considered to be of limited use to early childhood professionals and were not included in this review.

There are a number of frameworks for assessing children's participation (Council of Europe 2016; Save the Children 2014), but they are not included in this review. These are designed to assess how successfully programs designed to facilitate children's participation achieve their aim. While these frameworks do not describe the developmental trajectory of children, which is the goal of this review, they do provide a way of describing how well early childhood programs can succeed in facilitating children's participation. Early childhood professionals will find useful principles within these frameworks to evaluate the degree of children's participation in their own programs.

How can early childhood professionals assess connection?

Given the limited set of assessment tools available to assess orientation, curiosity and participation in young children, early childhood professionals will need to draw on their knowledge of the concepts of children's connection to their world, as well as their careful observation of children.

Orientation is closely tied to belonging and citizenship. What are the signs that a child is well oriented or feels they belong to a place, a group or a community? Early childhood professionals can observe signs of a child's level of comfort when they enter a place or a group, how familiar they are with the environment, and possibly how easily they 'fit in'. In a social context, how well a child

orients themselves to a new social situation can be indicated by their interactions with other children. How does the child enter other children's play, and what is the reaction of the other children? How do children find out information from one another, or from adults? How do they connect information across different contexts or activities?

In the social context, this leads naturally to assessing how children respond to diversity. The VEYLDF describes a sample of behaviours that early childhood professionals might notice, and then use to inform their teaching. These include showing concern for others, listening to others' ideas and reacting in positive ways to similarities and differences among people (VCAA 2017b, p. 4). Respect for diversity is closely linked to a child's own sense of identity. Early childhood professionals have an important role to play in supporting children's understanding of diversity.

Both orientation and curiosity involve a developing understanding of similarity and difference. These concepts are readily observed as a baby becomes attached to a particular caregiver, or a special toy or blanket. This object attachment is a form of orientation, and for most children it is balanced by displays of curiosity whenever a new object is presented. As a child develops, the amount of time they spend on an activity or in a particular environment can be an indication of their level of interest, or connection.

Educators can also observe connection behaviours that may not be healthy for a child, for example if they show a lack of connection to other children or avoid certain elements of the natural environment. Also some children can connect to objects, activities or technology in a dependent way, expressing anger when they are removed. Observing both the positive and negative aspects of connection helps early childhood professionals see the subtleties in each child's learning and development, so that they can provide the best possible support to each child.

Despite the lack of purpose-built assessment tools, early childhood professionals who make a conscious effort to observe and map a child's development in terms of orientation, curiosity and participation, in each of the social, natural, built and digital environments, will find they have a rich source of data. This data can then be used to describe children's connection with their world.

Contribution

What is contribution?

The concept of contribution can be thought of as how a connected child actively engages in their community, building on their connections with the people and world around them. Building on these connections by contributing enables children to feel confident and empowered to 'shape their world'. The VEYLDF's description of this Outcome focuses on group membership; contribution to family and social life; developing knowledge of their environments; and understanding, protecting and exercising rights and responsibilities (DET 2016). The key components include cooperation and negotiation; engaging in democratic decision-making and problem-solving; collaboration; and respect and care for natural and built environments (VCAA 2017b).

As with connection, the conceptual model condenses these into three components of how children shape their world, focusing on decision-making, negotiation and responsibility. These three components refer to how children understand and exercise their own sense of their rights and responsibilities to engage in a way that benefits themselves, their communities and the natural world.

When a child is motivated and has adequate information and cognitive and communication skills, they can be observed making informed decisions, which will contribute to their capacity to negotiate. With support, children will develop a sense of responsibility (and knowledge of and respect for rights), which is further supported by the practice of their decision-making and negotiation skills.

While contribution is a well-researched area in relation to middle childhood and adolescence, especially in terms of leadership and citizenship, it has been explored less often by early childhood researchers. Over recent decades there has been a shift towards engaging with young children as active contributors and citizens, rather than as simply 'citizens of the future'. In Australia this shift remains a work in progress (although it is more advanced in other countries, especially in the Nordic region). Young children have the capacity to contribute, but are largely excluded from decisions and actions that shape their communities and their world.

Just as children connect in different ways with different environments, their contribution to social, natural, built and digital environments involves quite different processes and skills and requires support. This review aims to encourage early childhood professionals to be sensitive to the many ways in which children shape their world from the moment they arrive in it. From birth onwards, children are contributing to social environments through the very act of connecting with others, including through non-verbal interaction, play, talk and collaborative work. One perspective on children's contribution to their world involves focusing on the mutual benefit of this

engagement and the extent to which it supports and motivates others to co-contribute.

Contributing to natural environments refers to promotion and protection of the environment, and commitment to sustainable practices (Hughes 2019). Contributing to built environments in early childhood involves the simple act of looking after physical resources, such as through tidying-up routines, as well as more complex engagements in adapting, planning, designing and creating built environments, both temporary and permanent, and of varying scales (from building structures in which to play, through to co-design of playgrounds and children's services). Although it can be helpful in sharpening observations to define what connection means in relation to each of these environments, the process of contributing rarely (and possibly never) happens in one environment alone, and more often will involve contribution in multiple environments.

Decision-making

There are four components of decision-making: understanding, appreciation, reasoning and choice (Appelbaum & Grisso 2001). To make a decision, there needs to be understanding of the situation that needs to be resolved. Appreciation reflects the ability to apply relevant information to a particular situation. Reasoning involves comparing and weighing the consequences of the available alternatives. Choice includes the ability to select the desired option and to sustain a consistent decision. Decision-making is closely related but different to problem-solving, in that it requires only the analytical and evaluative, rather than the generative or creative, aspects of problem-solving (Heard et al. 2020). For a child, making a decision requires an understanding of the problem (Kagan, Moore & Bredekamp 1995), so that they can understand the criteria for making the decision and recognise an ideal outcome (Facione 1990) and the ability to evaluate options (Ennis 1985).

Children are engaged in decision-making on a daily basis, but because of the degree of control that adults have over many aspects of their lives, there are corresponding limits to their involvement in decision-making and their influence over outcomes. As Hart's participation ladder (Figure 4) shows, involvement in decision-making through consultation does not equate to actively contributing to, or even leading, decision-making processes.

In addition to external constraints on a child's ability to engage in decision-making and to influence outcomes, young children also face barriers in relation to their own capacity, particularly in relation to complex challenges or issues. Children start to develop adult-like reasoning capacities by the age of 11 or 12, but prior to this, they often face obstacles in assessing multiple options, which is critical to sound decision-making (Gregan-Paxton & John 1997).

A great deal of research has been undertaken to understand children's competence in making decisions about their home/care arrangements (in relation to custody), their health (in relation to consent to procedures) and the age of criminal responsibility (Appelbaum 2008; Hein et al. 2014).

A major outcome of this research has been an increase in respect for and legal protection of children's autonomy to make decisions. In the context of the law, the competency to make decisions is linked to ability rather than age. A child is deemed competent when he or she 'achieves a sufficient understanding and intelligence to enable him or her to understand fully what is proposed' and has 'sufficient discretion to enable him or her to make a wise choice in his or her own interests' (Gillick v. Wisbech & West Norfolk AHA 1985 in Alderson & Goodwin 1993, p. 3).

This emphasis on supporting and increasing autonomy for the child exists in English and Commonwealth law, but varies considerably across cultures and within cultures (Pervan & Kwai-Choi Lee 1998).

While some aspects of children's decision-making remain contested, the importance of nurturing and supporting a child's analytical and decision-making skills is clear, as this can enable them to effectively shape their own lives and the world around them. There is a strong relationship between children's decision-making ability and their self-esteem (Park & Park 2012), suggesting that supporting the development of decision-making skills may also have a positive impact on a child's sense of identity.

Negotiation

Negotiation involves deliberation between two or more parties, with the aim of reaching an agreement. Negotiation often involves different and competing goals, but any effective negotiation process is underpinned by a common commitment to settle on a mutually satisfactory outcome. Two common processes or strategies are employed by negotiators: one is to revise the original proposal, seeking common ground on which both negotiators can settle; the second is to remain fixed on an original proposal, and convince another child or children through argumentation to adopt the same position (Baker 1994).

Negotiation involves a range of collaborative skills including coordination, communication, decision-making and conflict resolution. Its role in education emerged in the 1970s, when progressive educators and researchers argued that if the role of education is to prepare children for life, then teaching and learning should be underpinned by a spirit of negotiation (Bruner 1986). Since then, researchers' understanding of the importance of argument, contradiction and negotiation processes in learning has grown substantially (Resnick, Salmon & Zeitz 1991).

The process of negotiation can be empowering for anyone, but it is particularly so for young children, for whom major decisions are made by adults. Negotiation enables them to express their viewpoint, seek common ground and jointly settle on an agreed course of action. Importantly, for negotiation to work effectively, all negotiators must be relative equals, or at least perceive themselves to be (Baker 1994). Early childhood professionals can create the conditions for children to learn negotiation skills, by treating them as active co-creators of early childhood programs, rather than passive recipients.

Responsibility

Responsibilities and rights are closely linked, and many researchers consider them as two sides of the same coin. An increasing focus on the rights of the individual in Western societies should be balanced with a responsibility to others and the world around us. All rights point to responsibilities; if a child has a right, then another entity, and possibly that child as well, has the responsibility to protect, promote and provide for that right.

Understanding and abiding by rights and responsibilities requires respect for rights and responsibilities, for other people, and for the natural and built environments. In early childhood, citizenship can be defined as children understanding, demonstrating and enacting their rights and responsibilities in a positive way. While there has been a strong focus on responsibilities, rights and citizenship in late primary and secondary school curriculum, early childhood professionals and researchers are increasingly engaging with younger children, and finding that young children can be more knowledgeable and engaged in these issues than had previously been assumed. Some researchers argue that children as young as three years old can effectively engage with the ideas of rights, responsibilities and fairness, and that by age five, they can understand that there may be legitimate reasons for not complying with authority (Covell, Howe & McNeil 2008).

Another key theme in the research relates to the importance of early childhood professionals modelling rights and responsibilities in their own practice. Research has found that in schools, citizenship education is most effective when it happens in a democratic context (Covell, Howe & McNeil 2008). Before educating children about their rights and responsibilities in the wider context, early childhood professionals may choose to focus on how rights and responsibilities are exercised in ECEC settings, including by the adults in the room. This connects back to Bronfenbrenner's ecological model as used in the VEYLDF, where children's inner circles prepare them for the wider world.

Why is contribution important?

Contributing to family and social life, the community and the world around them enables children to develop a sense of purpose and agency, both of which are important aspects of learning and development in the early years. Being able and supported to contribute helps build vital skills for childhood and later in life. There is close interaction between a child's ability to contribute to their world and other components of learning in the VEYLDF Learning and Development Outcomes: children who explore and shape their world are more confident and involved learners and better communicators, with a stronger sense of their own identity and wellbeing.

Contribution also has particular relevance in the current global context, as older children are taking on a greater sense of responsibility for the world in which they live than previous generations did. In the past, children were largely considered citizens of the future, and educated accordingly, but young children are now regarded as capable and active contributors, and co-creators of communities and the world around them.

Many of the most fundamental values of tomorrow's society are also being formed in early childhood contexts today. Early childhood education therefore has a major role to play in achieving sustainable development. (Siraj-Blatchford 2009, p. 9)

Sustainable development is a concept that the United Nations uses to describe a better world in terms of social, economic, environmental and cultural development. For the world to achieve sustainable development in the future, children, from the earliest years of life, must learn that what they do can make a difference.

Tools for assessing contribution in the early years

The focus of this review is the assessment of children as being connected with and contributing to their world, and how they demonstrate development in the skills of decision-making, negotiation and responsibility. While these are fundamental life skills that we observe children using every day, this review has not been able to identify assessment tools that are designed to assess these skills in young children and practical for use by early childhood professionals. It may be that these skills are too complex to assess using the conventional methods applied in research, or it may be that a child's contribution to their world can be so diverse that standardised assessment tools cannot adequately assess them.

By looking further afield to related areas, such as the assessment of play and the 21st-century-skills movement, or the Capabilities curriculums used in Victorian schools (VCAA 2017a), educators can explore the research that could be useful for assessing children's contribution to their world. For example, there is current research that focuses on make-believe play as a way of observing children's self-regulation and negotiation skills in action.

The Mature Play Observation Tool (MPOT) (Germeroth et al. 2019) has a characteristic of metaplay, which refers to children's ability to step out of a pretend scenario and discuss various aspects of their play (p. 194). This is often a time at which children's decision-making, negotiation and responsibility skills are clearly evident. This is a new tool that was developed in the absence of any 'reliable observational measure of classroom play that captures information about children's make-believe play' (Germeroth et al. 2019, p. 193). Within a role-playing context, MPOT uses previous research (Bodrova, Germeroth & Leong 2013) to describe 'mature' play as when 'most children follow play scenario rules, applying them to themselves and others' (Germeroth et al. 2019, p. 195). Their research revealed a child's ability to regulate others precedes their own self-regulation.

Research into young children's understanding of active citizenship is also emerging. Twigg, Pendergast and Twigg (2015) investigated young children's lived experiences as a way of gauging their capacity for global citizenship. They found that the children were cognisant of similarities and differences between people in their world, and made thoughtful decisions about social connections and digital participation. Another Australian study specifically examined how civic identity and collective responsibility were expressed among a group of young Aboriginal children, highlighting how culture is inseparable from understandings of civic action (Phillips & Moroney 2017). Studies like these point the way towards more meaningful assessment of young children's connection with and contribution to their world in future.

How can early childhood professionals assess contribution?

Tools for assessing decision-making, negotiation and responsibility in young children are limited, which means that early childhood professionals may need to adapt tools developed to assess older children, and develop their own observation-based assessment and reporting practice.

Decision-making has a cognitive element. While we can observe when a child makes a 'good' or a 'poor' decision, there is not necessarily any observable behaviour that demonstrates the choices the child considered and the process they followed to make that decision. To assess decision-making, ensuring children 'are empowered to make choices and problem-solve to meet their needs in particular contexts' (VCAA 2017b), early childhood professionals set up problem-solving activities and discuss choices with children that reveal their understanding of rights, responsibilities and fairness in their world.

The Conceptual PlayWorld model of intentional teaching (Fleer 2018) is used in Respectful Relationships programs with young children, to assess how they form concepts

related to diversity and inclusion. A Conceptual PlayWorld is an imaginary scenario created by an educator, where young children are invited to go on imaginary journeys, meet challenges and solve problems, and learn about respectful relationships while playing. These scenarios might be set up to 'help children begin to think critically about fair and unfair behaviour' (VCAA 2017b). Another strategy is using stories and picture books to assess children's ability to 'understand and evaluate ways in which texts construct identities and create stereotypes' (VCAA 2017b).

A child's contribution to their built environment is readily observable. Wayfinding is evidence of a child's mental maps and memory, which become extended as exploration broadens their sphere of influence and contribution (Cornell & Heth 2006). Children can demonstrate responsibility in the way they care for their belongings, for their environment and for other people – particularly those more vulnerable than themselves. In order to develop a child's sense of responsibility, ECEC settings and schools can create 'positions of responsibility' that are age appropriate, and meaningful ways for children to contribute to their community. Contribution to their world may at times be less positive, for example when a child wilfully damages the physical environment, equipment or materials (Vorobyeva, Kruzhkova & Krivoshchekova 2015).

A child's contribution to their digital environment can also be observed through their participation in online games and simulations, social networking communities and coding communities such as Scratch (Digital Technologies Hub 2020). When observing a child in that world it is important to focus on what the child is creating or achieving through their participation, and not only their level of interest or engagement with the device as a recipient or 'consumer'. The first three levels of the Victorian Curriculum F–10 Technologies curriculum (2017a) provide a progression for children to design and follow directions to complete their own or group digital or technological projects. This progression can also be used by early childhood professionals in their assessment of a child's contribution in the digital world.

Play-based assessment provides an opportunity for early childhood professionals to 'identify the child's strengths, abilities and interests, and to inform planning of supports to promote the learning, development and meaningful participation of children with disabilities and developmental delays in family and community life' (DET 2017a, p. 7). A child's play is an expression of their sense of their place in the world, and imaginative play can also reveal a child's sense of how other people and objects experience that world (Germeroth et al. 2019).

The VEYLDf describes a range of behaviours that early childhood professionals can observe in children and then use to inform their teaching. These include taking action

to assist other children to participate in social groups, expressing an opinion in matters that affect them, and contributing to democratic decision-making processes about matters that affect their world (VCAA 2017b, p. 4).

Decision-making, negotiation and responsibility are also important skills for adults working in ECEC settings. By making these a focus for their own professional development plans and self-reflection, early childhood professionals can apply their understanding about their own development to their assessment of each child's development in contributing to their world. Through systematic observation, early childhood professionals can assess each child's contribution to their world as part of their critical reflection on their own practice, and come to see themselves as co-contributors in the same world as the children.

What are children's trajectories of connection and contribution in early childhood?

A child's ability to connect with and contribute to their world can develop in diverse ways, depending on the context in which they learn and grow. It is therefore difficult to describe what a learning and development trajectory might look like for this Outcome, especially given the scarcity of assessment literature that describes the Outcome with precision. Nevertheless, there are some general characteristics of children's learning and development trajectories that can help early childhood professionals to understand how they might observe and describe a child's progress against this VEYLDF Learning and Development Outcome.

Children's connection to the world is shaped by how much of that world they are exposed to in their everyday experiences. Children who experience a wide range of stimulating interactions and activities from birth will develop curiosity and the ability to orient themselves to unfamiliar environments and people, whereas children who have a narrower range of experience may become overwhelmed (Engel 2015). At the same time, overstimulation can result in children becoming disoriented and withdrawing from new experiences, resulting in disconnection rather than engagement (McGibben 2017). Adults who are sensitive will be able to carefully gauge the level of exploration that each child is ready to undertake.

Connection to the world is also fostered by positive experiences of connection, through which the child learns to value the expansion of their horizons or the deepening of existing relationships to places and people. As not all exploration will yield positive results, a child's development of a sense of connection to their world also depends on their ability to cope with setbacks, which can be fostered through encouragement and support (Cefai 2008). Risk-taking behaviours are an important

part of this learning, and early childhood professionals can encourage exploration of the world by providing safe but challenging environments for all age groups (Stephenson 2003).

Contribution to the world depends on both opportunity and engagement. Children develop a sense of their own agency by taking action, and seeing these actions produce results. Adults have an important role to play in providing children with opportunities to use their emerging power to achieve desirable goals. As they explore the scope of their influence, children can also shape their world in undesirable ways, if they choose to express their agency through challenging behaviour. Learning about decision-making, rights and responsibilities supports a child to understand the impact of their behaviour on the group, and to recognise that they have agency in their own choices and the negotiation of their relationships with others.

A child's connection with and contribution to their world involves a complex interplay of social, cognitive and physical development. As a baby learns to move their body from place to place, their world expands rapidly, bringing with it an array of choices to make, relationships to negotiate (with people and objects) and opportunities to make an impact. Similarly, a child's ability to contribute to their world grows with their knowledge and skills, and their ability to consider abstract ideas (Otsuka & Jay 2017). Adults who engage in sustained shared thinking with young children, and enable them to make suggestions and propose ideas, are helping to develop each child's understanding and reasoning skills.

These individual developmental trajectories are situated within the social context into which the child is born. A child's connection with and contribution to their world is heavily influenced by the values and beliefs of the significant adults in their lives, and their hopes for children's futures (White & Mistry 2016). Understanding each child's family context is therefore especially important; the child's family is the circle around the child in the ecological model. Early childhood professionals may encounter a wide spectrum of expectations related to this Outcome, from families who see obedience as integral to a child's contribution to their family and community, through to families who encourage children to take age-appropriate action to address local or global concerns (Yagmurlu & Sanson 2009). Family-centred practice requires early childhood professionals to reflect critically on their own assumptions, and recognise that children can demonstrate and develop connection and contribution in many different ways.

How does a child's connection with and contribution to their world relate to their executive function?

A child's connection with and contribution to their world is closely linked to executive function. There is considerable overlap between the components of executive function defined in the research literature, and the components of connection and contribution described in this review.

Executive function has been described as including the ability to deal with novelty (which aligns with orientation in this review), as well as the management of emotions and personal perspectives in decision-making (Chan et al. 2008). Similarly, responsibility (an aspect of contribution in this review) and inhibitory control (a component of executive function) are closely related in terms of their observable effects on a child's behaviour.

Although this Outcome is too complex and multifaceted to be directly linked with executive function, clues exist in the research about how the two reinforce one another. Diamond and Lee (2011) found that the best approaches to developing executive function are those 'that engage students' passionate interests, bringing them joy and pride' and 'give students a sense of belonging and social acceptance' (p. 965), suggesting that curiosity and connection are important for developing executive function. Similarly, a recent meta-analysis of parenting practices suggests that parents who provide cognitive stimulation and autonomy support (similar constructs to connection and contribution) have a significant effect on their child's development of executive function, especially in the earliest years of life (Valcan, Davis & Pino-Pasternak 2018). These same practices can be enacted by early childhood professionals in a range of early years settings.

A clearer link can be found between social connectedness and the development of executive function. Although most studies in this area demonstrate indirect links (for example, the impact of social disconnection on mood, or the impact of mood on executive function), the evidence is nonetheless compelling (Diamond 2013). Components of executive function such as working memory and cognitive flexibility require the ability to shift the focus of attention and adjust behaviour accordingly, to see things from different perspectives, and quickly and flexibly adapt to changed circumstances (Diamond 2013, p. 205). Thus, the social elements of children's play, such as taking turns, and exploratory imaginative play, support both executive function and connection and contribution. Wyver (2017) adds that executive function skills are not only associated with play but are also enhanced by physical activity (p. 88), which reflects the benefits of the physical aspect of connectedness to the built and natural environment.

The key difference between executive function and this Outcome is the contextualised nature of children's connection and contribution. Executive function describes attributes that are intrinsic to children, whereas this Outcome describes attributes that can only be observed in children's interactions with the world around them. While executive function can therefore be assessed using a standardised tool in a specific context, a child's connection with and contribution to their world can only be assessed by observing how they interact with a range of people, places and environments. The conceptual model developed for this review and its application to social, natural, built and digital environments demonstrates its breadth and provides a framework for organising observations.

In this way, children's connection with and contribution to their world enhances executive function by expanding the possible contexts to which executive function can be applied and therefore developed. Connection with their world may also enable a child to develop a broader range of skills that enhance their development of executive function, which in turn supports learning. For example, as noted by Ernst and Burcak (2019), a recent study found that children who had a greater exposure to nature in their ECEC setting developed greater curiosity, creative thinking and resilience than their peers who had had less exposure (although the level of executive function development was the same in both study cohorts). These children will be better equipped to contribute and connect because of their development of executive function.

Section 2: Principles for assessing children as connected with and contributing to their world

This section sets out principles for the assessment of children as connected with and contributing to their world. It is informed by the overriding principles of the Victorian Early Years Learning and Development Framework (VEYLDF):

All children benefit when assessment reflects a whole-child approach that may include their health and wellbeing, reveals their strengths, and shows what might next be learnt (DET 2016, p. 13).

In assessing children as being connected with and contributing to their world, educators face questions about how to select appropriate measures across phases of development, how to administer assessments, how to interpret the results and how to translate their findings into planning and communication with parents. There are a number of sources that provide advice in this area. The following six principles of assessment were used to guide selection of assessment tools to measure children's connection with and contribution to their world:

1. Assessment addresses established components of children's connection with and contribution to their world.
2. Assessment enables early childhood professionals to describe a trajectory of development.
3. Assessment is valid, reliable and fair.
4. Assessment is conducted in a way that enhances engagement and relationships.
5. Assessment includes children's self-assessment.
6. Assessment involves the child's community and informs professional partnerships.

To support children to connect with and contribute to their world, early childhood professionals may find it useful to build their knowledge of developmentally appropriate assessment tools that measure the key components of this Outcome outlined in Section 1. These assessments must be valid, reliable and fair for all children, including those from culturally diverse groups, and must be useful to educators. Figure 5 illustrates an overview of the principles that guided the selection of assessment tools evaluated in this review.

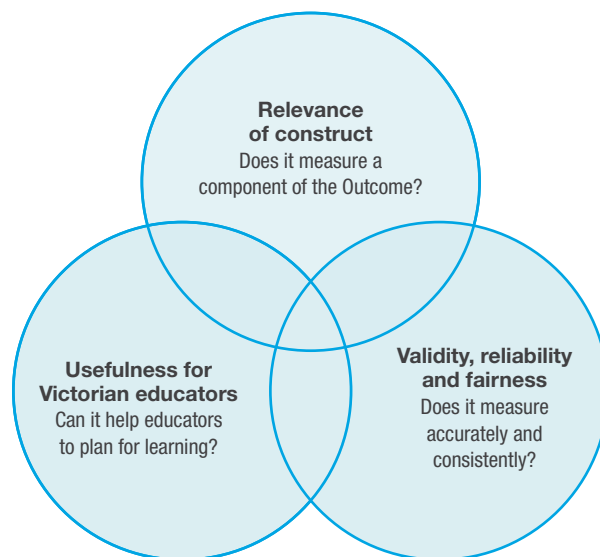


Figure 5: Overview of assessment principles

The principles outlined in this section are specifically related to assessments that early childhood professionals can use to inform their planning for each child's learning and development. This literature review is not about assessing quality of programs, ECEC settings or home learning environments.

Assessment addresses established components of children's connection with and contribution to their world

In order to assess an outcome, there must be clear agreement about the nature of that outcome. Assessment of children's connection with and contribution to their world is complex so it is important to have a clear conceptual model to support clear thinking about this Outcome. The conceptual model designed for this review is the construct against which assessment tools have been considered for relevance.

Assessment enables early childhood professionals to describe a trajectory of development

An assessment tool is more useful if it shows a positive trend over time for most children, rather than simply remaining at the same level for most children over multiple years. Early research on developing assessments of children's social attitudes and sense of responsibility found that this kind of trend was more likely to increase when it included more questions related to social and societal obligations than highly personal questions related to self-feelings, attitudes or reports of personal behaviour (Harris 1957, p. 326). In other words, a child's sense of their own capability to be socially responsible did not change much, but their expectations of others did show development.

There are other areas of development where a tool describes different levels, not to demonstrate growth but to categorise different yet equally valid ways of behaving. Play interaction is an example of this. It refers to the level of interaction between children when they are playing. Typically, four to six levels of interaction are described (Parten 1932) and the trend is for children to increase the proportion of associative and cooperative play over time. Commonly described levels of interaction include:

- Alone: a child in the same location as others but clearly engaging in a unique activity
- Parallel: a child playing independently on a task that others are also playing
- Associative: children interacting in the context of a scenario without a predetermined outcome or rules
- Cooperative: children acting out a planned scenario together in sequence with clear goals.

Assessment is valid, reliable and fair

A valid assessment means that the assessment tool truly measures what it claims to measure. A reliable tool is constructed in a way that ensures it is able to produce valid results consistently, across different contexts. For an assessment to meet accepted standards, both validity and reliability must be addressed (National Research Council 2008).

Fairness means all children have equal opportunity to show their true ability or level of development on the assessment. Many of the contexts in which educators are assessing children's connection with and contribution to their world will be group activities. Collaborative play-based assessment means observers have to note and understand multiple factors and responses, across multiple children. Depending on the composition and functioning of particular groups, this may disadvantage some children, particularly where cultural or language differences make it difficult for them to 'know the rules' or participate.

One way of mitigating this risk is to provide multiple opportunities for children to demonstrate success in a skill or activity. Educators can ensure they provide a range of assessment opportunities, in a range of modes and group formations, to suit the needs of specific children.

Assessment is conducted in a way that enhances engagement and relationships

Play-based assessment is particularly suited to assessment of children's connection with and contribution to their world. One of the positive things about this form of assessment is that it can be conducted in early years settings and the community, reducing any concern about laboratory-style testing. Engagement and relationships are enhanced when early childhood professionals acknowledge that their children are part of diverse communities and worlds. In their assessment practice early childhood professionals work to:

- include the perspectives, knowledge, experiences and expectations of families
- provide families with information and ideas to support the child's learning at home and in other services
- value the culturally specific knowledge about children and their identity, wellbeing, learning and development that is embedded in their communities (DET 2016, p. 13).

Assessment includes children's self-assessment

According to the VEYLDF, early childhood professionals assess children's learning in ways that 'are receptive to and include children's views of their own learning' (DET 2016, p. 13). For this Outcome, which is focused on a child's contribution, early childhood professionals should consider reflecting on how they have provided children with an opportunity to reflect on their connection and contribution.

To include a self-assessment component involves encouraging children to reflect on questions including: What have we learnt or achieved? What did I do well? How could we improve what we did? And most importantly: What do I want to do next? It is challenging to find channels for self-assessment with a preverbal or non-verbal child, and exploring the use of emojis or other visual aids may help elicit responses from very young children or those not able to respond verbally.

Assessment involves the child's community and informs professional partnerships

It is meaningless to assess a child's connection with their family or community in isolation from that family or community. While many early childhood professionals focus their assessment of the child on the world within the ECEC setting, there is a growing recognition of the benefits of children exploring their communities beyond the ECEC setting by going on excursions (subject to the relevant requirements) or through incursions by members of the community. Partnerships with parents are also critical for developing a more complete and accurate knowledge about the child in other contexts. The Organisation for Economic Co-operation and Development (OECD) emphasises the role of the neighbourhood or community as a 'connector' between families and early years services, as a social network, especially for disadvantaged families, and as an environment to promote social cohesion, and as a source of resources (OECD 2012, p. 12).

Early childhood professionals will realise that their own connection with and contribution to their community is important for the same reasons it is valuable for children. Early childhood professionals need to know the communities that children are members of so they are able to assess the strength of each child's experience of that same community. Engaging with local and professional communities, as well as engaging in learning about the wider world, helps early childhood professionals to orient themselves within the world that each child inhabits, and recognise the lifelong skills and attitudes that children need to connect with and contribute to their world.

Section 3: Summary matrix of tools for assessing children as connected with and contributing to their world

Sections 3 and 4 identify and describe six tools for assessing children as connected with and contributing to their world. Table 1 shows which component of connection and contribution each tool can be used to assess, as well as the age group it is suitable for. Tools that have limited availability or that require a non-early childhood professional qualification have not been included.

Table 1: Summary of tools for assessing children as connected with and contributing to their world

Tool	Age range			Administration			Connection			Contribution			Australian tool
	0-3 years	3-6 years	6+ years	Professional	Child	Parent	Orientation	Curiosity	Participation	Decision-making	Negotiation	Responsibility	
Connection													
Connectedness to Nature Index for Parents of Preschool Children (CNI-PPC)		●				●	●					●	
Assessment Framework for Children's Human Nature Situations (ACHUNAS)	●	●	●	●			●	●	●			●	
Asset-Based Content Matrix	●	●	●	●		●	●		●				
Contribution													
Children's Voices		●	●	●	●	●			●	●	●	●	●
Mature Play Observation Tool (MPOT)	●	●	●	●	●					●	●	●	
Desired Results Developmental Profile (DRDP)	●	●	●	●		●			●		●	●	

Section 4: Evaluation of existing tools for assessing children as connected with and contributing to their world

The following tools can be used to assess children aged birth to eight years as connected with and contributing to their world. As well as assessing different components of the Outcome, these tools vary in quality, in type or mode of administration, and in who is the informant in the assessment (that is, the person who supplies the information during the assessment process, which may be the child or an adult).

The descriptions provided here are written to support early childhood professionals to consider how the tool assesses a particular aspect of connection and contribution, whether the tool is useful for their context, what is involved in its administration, and the value of the tool in early childhood settings. The tools are presented in alphabetical order and can be referenced in the summary matrix in Section 3.

Assessment Framework for Children’s Human Nature Situations

Overview

The Assessment Framework for Children’s Human Nature Situations (ACHUNAS) is a very recent research-based framework that addresses assessment of child-nature-connecting (CNC) environments. It sets out to guide the assessment of where and how children connect to nature, stimulating both the design of nature-connecting human habitats as well as pedagogical approaches (Giusti et al. 2018, p. 1).

Instrument description

Through interviews and surveys with professionals, researchers from the University of Stockholm identified 16 qualities of significant nature situations: entertainment, thought-provocation, awe, surprise, intimacy, mindfulness, self-restoration, creative expression, physical activity, challenge, engagement of senses, child-driven, involvement of mentors, structure/instructions, social/cultural endorsement, and involvement of animals.

The researchers also developed a list of 10 abilities of human-nature connection that express the nuances of children’s human-nature connection. This is expressed as a progression: being in nature, being with nature, and being for nature.

Table 2: Human-Nature Connection (ACHUNAS)

Being IN nature	Being WITH nature	Being FOR nature
<ul style="list-style-type: none"> feeling comfortable in natural spaces being curious about nature 	<ul style="list-style-type: none"> reading natural spaces acting in natural spaces knowing about nature feeling attached to natural spaces recalling memories with nature 	<ul style="list-style-type: none"> taking care of nature caring about nature being one with nature

From this list they developed the Assessment Framework for Children’s Human Nature Situations (ACHUNAS), described as ‘a comprehensive framework that outlines what to quantify or qualify when assessing “child-nature connecting” environments’ (p. 1). Child-nature-connectedness is defined as ‘the sum of influences that the surroundings, opportunities, or conditions of life have on promoting human-nature connection in individuals or populations of children’ (p. 2). A diagram of the full framework is set out in Giusti et al. (2018, p. 16).

Discussion

This is a newly developed framework and the limited available literature describes its development rather than implementation or use with extended cohorts of children. It also has a significant number of lengthy components, and it may not be immediately clear to early childhood professionals how they might use this framework in their assessment of children.

This stems from the fact that rather than assessing children, the framework defines criteria and guidelines to assess whether an environment connects children to nature or not (p. 2). ACHUNAS highlights what to assess, but it does not provide guidance on how to assess child-nature-connectedness (p. 17).

Nevertheless, its criteria can inform assessment practice related to this Outcome. The list of 10 abilities of human-nature connection provides early childhood professionals with a progression against which they can assess children’s disposition as being in nature, being for nature or being with nature. The 16 qualities of significant nature situations can also inform an evaluation of the range of environments that children are experiencing.

In terms of limitations of ACHUNAS, the researchers acknowledge that ACHUNAS is built upon professionals' understanding of children's nature connectedness, and lacks children's input and insights (p. 17).

Asset-Based Context Matrix

Overview

The Asset-Based Context Matrix (Wilson, Mott & Batman 2004) is a tool for assessing a child's learning opportunities and participation in natural environments. Information is gathered through conversations with parents, as well as through interactions with and observations of the child in natural environments.

Instrument description

The Asset-Based Context (ABC) Matrix focuses on three types of learning contexts:

- family activity settings
- community activity settings
- early childhood activities.

It looks at five characteristics of child behaviour: assets, interests, functionality, opportunity and participation.

Assets are the child's particular abilities or strengths, talents and capabilities (for example, smiling, vocalising, reaching, crawling or jumping), looking for meaningful interactions that promote and increase participation in everyday activity in an independent, competent and satisfying manner. The term 'functional' is used to mean the relationship between child behaviour and its socio-environmental consequences (for example, increased participation and mutually beneficial interactions). 'Opportunity' refers to the number of chances (quantity) and the quality of those experiences occurring in activity settings that promote increased social and non-social child participation in cultural activity.

'Participation', in this context, refers to the ways in which a child takes part in everyday activities, which helps them strengthen existing abilities and also learn new skills.

Discussion

The matrix tool is based on research evidence indicating that children's learning is enhanced in contextually meaningful learning environments. This tool comes from a special education context. Early childhood professionals or Early Childhood Intervention Services (ECIS) providers use the matrix to collect information for each of the components through observations, interviews, and conversations with parents or carers. It is heavily reliant on reporting by parents. It is designed as a tool to support professionals to develop appropriate interventions or activities for children, described in the

matrix as possibilities – or ways in which a child and family can expand the child's opportunities to learn and participate. In its current form, the tool is descriptive rather than evaluative.

In an assessment context, the usefulness of this tool for early childhood professionals lies in its matrix presentation, which provides a way to record and describe the multiple elements of this Outcome. Across the top of the matrix are the key environments or 'worlds' that a child is part of, described in this tool as Family Life, Community Life and Early Childhood Settings. The seven components down the left-hand column of the matrix provide prompts that encourage parents and early childhood professionals to consider a child's connection with and contribution to their world at a deeper level. When complete, the matrix yields a rich array of information about a child's life across three parts of their world.

Children's Voices

Overview

Children's Voices: A principled framework for children and young people's participation as valued citizens and learners (Harris & Manatakis 2013) is a collection of tools and resources designed to support and empower children and young people's participation as active citizens and learners (p. 9). It is a professional learning resource to guide consultation with children, rather than an assessment tool of children's learning. By engaging in genuine consultation with children in the ways described in this resource, educators would have a rich source of data to use in assessment of this Outcome.

Instrument description

The 68-page framework document provides detailed guidelines on how adults can design and facilitate opportunities for children's voices to be authentically engaged in decision-making about their world. The research is based on multimodal consultations that took place in early years settings involving children, educators, families and policy officers. These consultations were documented through observations, interviews, scribing of children's conversations, photographs and artwork. The focus was on 'analysing, synthesising and reporting children's messages in ways that are authentic and true to children's meanings while speaking to an official audience' (p. 12). The project also involved tracking the uptake and consequence of children's messages, as well as providing feedback to children about follow-on effects over time.

To ensure careful planning and preparing for consultation with children, the guiding principles of the framework include:

- viewing the child as a valued citizen and social actor
- appropriateness, including engagement being pitched to children in terms of age, individuality and culture
- respect for the child
- shared understanding
- handing the agenda to the child
- being mindful of power
- ethical considerations.

Discussion

This framework is specifically developed for the Australian context, directly addressing Learning Outcome 2 of the Early Years Learning Framework (Australian Government DET, 2009), *Children are connected with and contribute to their world* (p. 25). It was developed as a research partnership between the University of South Australia and the South Australian Department for Education and Child Development.

The framework document is freely available online and is licensed by the South Australia Government for non-commercial re-use, making it available for early years settings to adapt to their needs. Educators looking to assess children’s connection with and contribution to their world could extend the framework to include what they will be looking for to indicate that children are in fact connecting with and contributing to the consultation.

Connectedness to Nature Index for Parents of Preschool Children

Overview

The Connectedness to Nature Index for Parents of Preschool Children (CNI-PPC) (Sobko, Jia & Brown 2018) is a tool for understanding and predicting environmental attitudes and behaviours among preschool-aged children.

Instrument description

CNI-PPC was developed when the researchers identified that valid tools to measure connectedness to nature (CN) ‘are needed but do not exist, especially for use with preschoolers’ (p. 1). They defined connectedness to nature as ‘an individual’s affective, experiential connection to nature’ (Mayer & Frantz 2004). In young children, connectedness to nature is associated with both the cognitive and the affective.

They developed a modified version of the Connectedness to Nature Index (CNI) and tested it among the parents of preschool children in an urban setting. Results suggested that a child’s relationship to nature, through parental perceptions, is most strongly characterised by empathy for nature, enjoyment of nature, awareness of nature, and responsibility toward nature.

After a two-stage pilot process, they developed and administered a 16-item questionnaire (CNI-PPC) to a sample of Hong Kong parents of preschool-aged children. The scale captures connectedness to nature across four major dimensions (p. 7) as shown in Table 3.

Table 3: Connectedness to Nature Index

Dimensions	Sample scale items
Enjoyment of nature	<ul style="list-style-type: none"> • My child likes to hear different sounds in nature. • My child enjoys touching animals and plants.
Empathy for nature	<ul style="list-style-type: none"> • My child feels sad when wild animals are hurt. • My child is heartbroken when animals pass away.
Responsibility toward nature	<ul style="list-style-type: none"> • My child believes that picking up rubbish from the ground can help nature. • My child treats animals, plants, and insects with care.
Awareness of nature	<ul style="list-style-type: none"> • My child chooses to read about plants and animals. • My child feels the difference between indoor and outdoor.

Discussion

Given the highly urbanised environment of Hong Kong, the authors of the CNI-PPC tool were also interested in the ‘opportunity to measure and further understand the relationship between connecting young children with nature and their psychological wellbeing’ (p. 10). CNI-PPC is a short and user-friendly tool, and is considered to be a reliable instrument in terms of its internal consistency (p. 14). The CNI-PPC was adapted and validated in a parent-proxy study, to measure connectedness to nature at an age when children cannot respond for themselves. The tool has been used in a small number of studies (Barrable & Booth 2020), and there are open-access articles that provide the full set of 16 items.

Desired Results Developmental Profile

Overview

Desired Results Developmental Profile (DRDP) (California Department of Education 2015) is an extensive observation-based rating tool designed to help educators assess a child according to a particular level of developmental progress. There are five measures in the History – Social Science (HSS) domain (pp. 48–52) that can inform the assessment of children’s connection with and contribution to their world.

Instrument description

The full Desired Results Development Profile is a developmental continuum from early infancy to kindergarten entry. There are two versions of the tool. Children from birth to three years of age are assessed with the Infant/toddler View, and children three to five years of age are assessed with the Preschool View. It is administered through observation in natural ECEC settings by teachers and other service providers and by family members in home and community settings. Observation should be ongoing throughout the year. The History – Social Science domain is included only in the Preschool View and contains the following five measures relevant to this review:

- HSS 1: Sense of time – Child increasingly communicates or demonstrates awareness about past and future events and relates them to present activity (p. 48)
- HSS 2: Sense of place – Child demonstrates increasing awareness of the characteristics of physical environments and connections among their attributes, including the people and activities in them (p. 49)
- HSS 3: Ecology – Child develops an awareness of and concern for the natural world and human influences on it (p. 50)
- HSS 4: Conflict negotiation – Child shows increasing understanding of the needs of other children and is increasingly able to consider alternatives and to negotiate constructively in conflict situations (p. 51)
- HSS 5: Responsible conduct as a group member – Child develops skills as a responsible group member in an early education setting, acting in a fair and socially acceptable manner and regulating behaviour according to group expectations (p. 52).

Discussion

The DRDP was designed to be used in Californian early intervention and preschool programs. It is based on developmental research and theory, includes developmental sequences of behaviour, and uses examples that early years professionals will recognise

as familiar activities and routines in early years settings. Each developmental level specifies a point along the continuum. The points are labelled:

- Responding: Generally, knowledge, skills or behaviours observed during early infancy
- Exploring: Generally, knowledge, skills or behaviours observed in later infancy, toddlerhood and early preschool
- Building: Generally, knowledge, skills or behaviours observed in preschool
- Integrating: Generally, knowledge, skills or behaviours observed in late preschool and early school years.

Each measure has a descriptor at each level that identifies knowledge, skills or behaviours that are observed at that specific developmental level along the continuum. There are examples to illustrate the descriptors, showing one possible way that a child might demonstrate relevant knowledge, skills or behaviour.

There are a number of online resources provided for professionals to assist in the use of this assessment.

Mature Play Observational Tool

Overview

The Mature Play Observation Tool (MPOT) (Germeroth et al. 2019) addresses specific behaviours and components that are defined as ‘mature play’. This is characterised as when ‘most children follow play scenario rules, applying them to themselves and others’ (p. 195) and includes the concept of metaplay, which refers to children’s ability to step out of a pretend scenario and discuss various aspects of their play (p. 194). This is often a time when children’s decision-making, negotiation and responsibility skills are clearly evident.

Instrument description

MPOT is used within a role-playing context. It includes both teacher and child dimensions, and provides detailed and tiered items as a systematic means for observing the complexities of mature play. The subcomponents of each dimension are described and scored using four levels of ratings. The child dimensions include the following items:

- children’s use of self-created props
- engagement in metaplay
- role-playing
- the use of role-specific speech
- the nature of play interactions.

Discussion

This tool has been developed from a base of research and theory regarding components of mature play (Bodrova, Germeroth & Leong 2013). The authors summarise and discuss how they capture aspects of mature play, emphasising a Vygotskian view of play as ‘an imminently cultural activity with adults assuming a critical role in engaging children in play and in supporting and scaffolding play as it develops’ (p. 213). To enable child development – to create the zone of proximal development – ‘play itself must not remain frozen at the same level throughout early-childhood years, but instead it needs to evolve to reach its most mature level’ (p. 120).

This is a new tool that was developed in the absence of any other ‘reliable observational measure of classroom play that captures information about children’s make-believe play’ (Germeroth et al. 2019, p. 193). The MPOT evaluation was undertaken as part of a larger study examining the effects of a maths- and play-based intervention. It involved extensive training for teachers who were part of the study (eight sessions lasting between two and four days). Teachers then implemented specific play themes over a four- to six-week period.

Preliminary data demonstrated that the MPOT has high overall reliability and high content validity. There were significant differences between treatment and control classrooms on components of play. Treatment classrooms exhibited more key components of mature play, and these teachers were more likely to intervene in play briefly and specifically to encourage continued play, and less likely to intervene exclusively to manage child behaviour (p. 119).

Summary

This literature review identified and defined the key components of the VEYLDF Learning and Development Outcome *Children are connected with and contribute to their world*.

The review has revealed that currently limited work has been done to address assessment of young children's connection with and contribution to their world, particularly in Australian contexts. Assessment tools that span key aspects of children's connection with and contribution to their world were selected for review. Six principles for assessing children's learning were identified and described. These principles can be used by early childhood professionals to inform their decisions about assessment.

The tools selected have been validated to varying degrees, and most are accessible to and can be administered by early childhood professionals. A key finding of this literature review is that there are relatively few contemporary tools available to measure this Outcome that are available to educators and that have been validated with culturally diverse populations. The review concludes that there is scope to further describe the constructs related to this Outcome, and to develop new tools that are fit for purpose and that can be used by educators to assess children's connection with and contribution to their world from a strength-based approach.

Glossary

Agency: Having a sense of autonomy and being able to make choices and decisions, to influence events and to have an impact on one's world.

Attributes: Characteristics of a person, such as age, gender, ethnicity, social class, language background, personality, behaviour, and physical aspects. Attributes may be changeable over time, or fixed throughout a lifetime.

Cognitive flexibility: Human capacity to adapt mental processing strategies in the face of new conditions, to switch between different concepts, to think about multiple concepts simultaneously, or to think about something from another perspective. With working memory and inhibitory control, it is a key element of executive function.

Connectedness to nature: An individual's affective and experiential connection to nature.

Construct: A construct is a theoretical idea, such as a quality or attribute that, while not directly measurable, can be assessed if broken down into observable properties.

Country: Aboriginal and Torres Strait Islander ongoing connection to place, collective spaces, ancestral heritage, values and cultural obligations.

Curiosity: A state of motivation associated with exploration, openness to new experiences and willingness to engage with the unexpected.

Decision-making: Identifying and choosing alternatives based on values and preferences.

Disposition: Specific motivational, temperamental or emotional trait, habit or response that contributes to a child's personality.

Diversity: The variety of differences in people, including their cultural and language backgrounds, religion, values, sexual orientation, abilities, educational background, socio-economic status, lifestyles and gender.

Early childhood professionals: The term early childhood professionals includes, but is not limited to, maternal and child health nurses, early childhood practitioners who work directly with children in early childhood education and care settings (educators), school teachers, family support workers, preschool field officers, inclusion support facilitators, student support service officers, primary school nurses, primary welfare officers, early childhood intervention workers, play therapists, health professionals and teachers working in hospitals, and education officers in cultural organisations.

Ecological model: A conceptual model and set of principles for understanding the interrelationships between personal and environmental factors.

Empathy: The ability to understand and share the perspectives of others.

Executive function: A specific set of attention-regulation skills involved in conscious goal-directed problem-solving. These skills include cognitive flexibility, working memory and inhibitory control.

Fairness: Being equitable in the treatment of others, including considering learners' characteristics and experiences that may advantage or disadvantage them in any particular assessment.

Inhibitory control: The process of self-control that enables a person to purposefully ignore a potential distraction, and to modify their response. With working memory and cognitive flexibility, it is a key element of executive function.

Involvement: Taking part in an activity at a level of engagement that exhibits sustained concentration, intrinsic motivation, focus and learning.

Mature play: Sustained pretend play in which children take on specific roles and consistently engage in pretend actions, speech and interactions appropriate to their characters.

Metaplay: Explanatory out-of-role comments made during imaginary play that are used to negotiate roles and manage the game.

Negotiation: The deliberation between two or more parties, aimed at reaching an agreement.

Object attachment: A child's attachment to a particular object, toy or resource for psychological comfort, sometimes known as a transitional object.

Orientation: A child's physical sense of themselves in the world, or their feelings about a particular subject, and the ability to find their way and explore their world.

Reliability: An assessment's ability to produce valid results consistently, across contexts.

Skills: A child's ability to do specific mental and/or physical activities that may require practice in order to be performed proficiently. Skills can be both taught and learnt.

Social skills: Competence that facilitates interpersonal communication and appropriate behaviours in a social setting.

Trajectories: Developmental trajectories are a curve of repeated observations of an aspect of development. Individuals may differ in the starting point, the degree of acceleration or deceleration, the timing of acceleration or deceleration, or overall shape of the curve.

Transition: The process of moving between environments or routines, including between home and early childhood settings.

Trust: A belief that someone's words, actions and honesty can be relied upon in a range of social contexts.

United Nations Convention on the Rights of the Child (UNCRC 1989): A human rights treaty that sets out the civil, political, economic, social, health and cultural rights of children.

Validity: Level of assurance that an assessment tool in fact measures what it claims to measure.

Wayfinding: The process of orienting oneself in physical space and navigating from place to place.

Working memory: The ability to hold and manipulate distinct pieces of information over a short period of time. With cognitive flexibility and inhibitory control, it is a key element of executive function.

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