Principles that underpin the Discovery-based Inquiry approach:

**by Deb Vietri September 2018**

Previously we have outlined 8 Principles that underpin the Discovery-based inquiry approach that reflect sound contemporary thinking and research into early years learning. In this article I have expanded on four of the 8 Principles and made connections to research and current philosophy that supports this thinking.

### Learning dispositions empower students

***Our job as teachers is not to ‘prepare’ kids for something; it is to help kids learn to prepare themselves for anything.* A.J Juliani**

### The *National Goals for Australian Schooling* as outlined in the Melbourne Declaration (2008) identified 2 goals for Australian students. Goal 2 is: *All young Australians become successful learners, confident and creative individuals, and active and informed citizens*.

### Information and knowledge in our world today is increasing at an exponential level. In order to equip young learners with the capacity to access and use knowledge in creative and innovative ways we need to focus on building their dispositions and skills as learners. ‘Learner Dispositions’ can be defined as; characteristics or behaviours that successful learners draw on when faced with situations or problems that are not easily solved.

### *In the Discovery-based inquiry approach* we focus on the process rather than product. We create learning opportunities that require; deep thinking, problem-solving, communication and collaboration; as well as explicit teaching and noticing and naming of learner dispositions.

### If we can develop the young people in our care as curious, creative and resourceful learners we will empower them to be successful, confident and capable individuals.

**Research and philosophy that supports this principle:**

**Andreas Schleicher, Director for Education and Skills OECD in: The Future of Education and Skills, Education 2030 OECD Position Paper April 2018**

We are facing unprecedented challenges – social, economic and environmental – driven by accelerating globalisation and a faster rate of technological developments. At the same time, those forces are providing us with myriad new opportunities for human advancement. The future is uncertain and we cannot predict it; but we need to be open and ready for it. The children entering education in 2018 will be young adults in 2030. Schools can prepare them for jobs that have not yet been created, for technologies that have not yet been invented, to solve problems that have not yet been anticipated. It will be a shared responsibility to seize opportunities and find solutions.

To navigate through such uncertainty, students will need to develop curiosity, imagination, resilience and self- regulation; they will need to respect and appreciate the ideas, perspectives and values of others; and they will need to cope with failure and rejection, and to move forward in the face of adversity. Their motivation will be more than getting a good job and a high income; they will also need to care about the well-being of their friends and families, their communities and the planet.

Education can equip learners with agency and a sense of purpose, and the competencies they need, to shape their own lives and contribute to the lives of others.

Read more: [http://www.oecd.org/education/2030/E2030%20Position%20Paper%20(05.04.2018).pdf](http://www.oecd.org/education/2030/E2030%20Position%20Paper%20%2805.04.2018%29.pdf)

**Guy Claxon: Cultivating positive learning dispositions (2008)**

Dispositional approaches set themselves the task of helping teachers to support the development of positive learning dispositions that will stand young people in good stead wherever they find themselves.

***Infusion rather than add on***

Orchestrating opportunities for students to learn together, discussing hard problems, sharing ideas, swapping between the roles of ‘learner’ and ‘teacher’ amongst themselves, becomes a higher priority for a dispositional teacher. So-called ‘reciprocal’ and ‘peer’ teaching have been shown to be effective at building the knowledge and the confidence of both the ‘tutor’ and the ‘learner’. The nature of learning conversations, and the vocabulary that is used to articulate the process of learning, are also important. And dispositional teachers quickly come to see that opportunities for them to model positive learning dispositions are also valuable. It becomes part of their professional role to seize and create chances to say ‘I don’t know’, ‘Could you explain that to me again: I didn’t get it’, or ‘That’s a good question: I’ve never thought of that’.

***Whole-school rather than just Classroom-based***

The heightened recognition of the importance of language, modelling, student involvement and ownership, and other tell-tale aspects of cultural value – as well as pedagogy – draws attention to the impact that the whole-school environment can have on the development of students’ ‘learning power’. Where the earlier approaches to learning-to-learn focused exclusively on what the teacher was doing in the privacy of her classroom, more recent approaches, such as ‘building learning power’, are on the look-out for opportunities to embed L2L messages in the life of the whole school.

Read more: <https://www.seas.upenn.edu/~eas285/Readings/Claxton.Learning%20Dispositions.pdf>

**Margaret Carr and Guy Claxton: A framework for teaching learning: the dynamics of disposition 2004 (A peer reviewed article)**

In our previous work (e.g. Carr, 2001; Carr & Claxton, 2002; Claxton 2002), we, like many others, have argued that education for the 21st century must aim at developing young people’s ability to be skilful and confident when facing complex predicaments of all kinds. While it is important to present students with valuable and engaging topics, this ‘content curriculum’ ought to be accompanied by attention to the attitudes, values and habits towards learning in general which are being strengthened (or weakened) in the process—what we have called for the purpose of this paper the ‘learning curriculum’. Like others (such as Perkins Jay & Tishman, 1993) we have tended to articulate these goals in terms of a combination of learning inclinations, sensitivities to occasion, and skills. We have described them as being *ready*, *willing* and *able* to engage profitably with learning.

These attributes, in whole or part, have been variously called dispositions (Katz, 1993; Perkins *et al.*, 1993) orientations (Dweck, 1999), habits of mind (Costa, 2000) and participation repertoires (Comber, 2000; Carr, 2001). Most definitions have particularly highlighted the importance of ‘inclinations’, though the concept has proved ‘hard to pin down’ (Perkins *et al.*, 1993, p. 18) with the degree of clarity that would be helpful to teachers. Carr (2001) and Cowie and Carr (in press) have attempted to clarify the situation by suggesting that ‘inclinations’ are centrally associated with identity as a learner, social schema, and ‘possible self’ (Cross & Marcus, 1994).

Read more: <https://www.tandfonline.com/doi/abs/10.1080/09575140320001790898>

### 2. Pedagogy of inquiry

***If you can light the spark of curiosity in a child, they will learn without any further assistance, very often. Children are natural learners.* Sir Ken Robinson**

Children are naturally curious. Research says that children entering school at 5 years of age ask hundreds of questions per day. What we do at school can either encourage or thwart their predilection to be curious. Inquiry-based learning involves students becoming curious and seeking answers to questions that are important and meaningful to them. It is constructivist in it’s approach, requiring students to engage actively in the finding out process and thinking deeply to process and analyse new information. At the heart of inquiry is the quest to make meaning as students build on and challenge prior knowledge to create new and deeper understandings.

***In the Discovery-based inquiry approach*** inquiries can be sparked by a strategic immersion designed by teachers (teacher-initiated inquiry) or can come from student interest and curiosity (student-initiated inquiry). Teacher-initiated inquiries can be drawn from a whole school approach to curriculum in the form of ‘throughlines’ or a ‘conceptual framework’ or from the Victorian Curriculum. Student interests and wonderings after the immersion then form the basis of the subsequent inquiry. Equally though, inquiries may emerge from teachers noticing rich possibilities during Discovery where students reveal things they are curious about in a range of ways. This notion of the emergent curriculum requires teachers to be open and flexible in responding to the teachable moments that present themselves by watching, listening to and engaging in learning conversations with students. This approach is not ad hoc or unplanned, in fact the opposite is true. Teachers need to be proactive and have a strong understanding of the curriculum and pedagogy to guide the learning effectively. They need to; facilitate the inquiry, ask more than they tell, explicitly teach ‘just in time’ skills, and give constructive feedback.

**Research and philosophy that supports this principle:**

**Bridget Barron and Linda Darling-Hammond: Edutopia; Teaching for Meaningful Learning: A review of research on inquiry-based and cooperative learning**

Education today must focus on helping students learn how to learn, so they can manage the demands of changing information, technologies, jobs, and social conditions. How do we prepare our students for these twenty- first-century skills?

Traditional academic approaches—narrow tasks that emphasize memorization or the application of simple algorithms—won’t develop students who are critical thinkers or students who can write and speak effectively (Bransford, Brown, & Cocking, 1999; Bransford & Donovan, 2005). To develop these higher-order skills, students need to take part in complex, meaningful projects that require sustained engagement, collaboration, research, management of resources, and the development of an ambitious performance or product.

In fact, a growing body of research suggests that students learn more deeply and perform better on complex tasks if they have the opportunity to engage in more “authentic” learning—projects and activities that require them to employ subject knowledge to solve real- world problems. Studies have shown a positive impact on learning when students participate in lessons that require them to construct and organize knowledge, consider alternatives, engage in detailed research, inquiry, writing, and analysis, and to communicate effectively to audiences (Newmann, 1996). For example, a study of more than 2,100 students in 23 schools found significantly higher achievement on intellectually challenging performance tasks for students who experienced this kind of “authentic pedagogy” (Newmann, Marks, & Gamoran, 1995). Indeed, use of these practices resulted in stronger performance regardless of race, gender, or prior achievement.

Read more: <https://backend.edutopia.org/sites/default/files/pdfs/edutopia-teaching-for-meaningful-learning.pdf>

**Mary Ann Biermeier Inspired by Reggio Emilia: Emergent Curriculum in Relationship-Driven Learning Environments**

Emergent curriculum is not a free-for-all. It requires that teachers actively seek out and chase the interests of the children. This kind of teaching environment demands a high degree of trust in the teacher’s creative abilities, and envisions an image of the child as someone actively seeking knowledge. It is a perspective that turns structured curriculum, with predetermined outcomes, on its head. A standardized curriculum that is designed to replicate outcomes often eliminates all possibility of spontaneous inquiry, stealing potential moments of learning from students and teachers in a cookie-cutter approach to education in the classroom. Given the diversity of the children we teach, accepting a canned recipe for teaching, evaluation, and assessment is problematic at best. Each child we teach is unique, requiring us to use our own judgment, instead of rules, to guide our teaching practice. To teach well, educators must ensure that creativity and innovation are always present. Although good teaching requires organization and routines, it is never inflexible and rarely routine. It dances with surprise. It pursues wonder. It finds joy at every turn.

Read more: <https://www.naeyc.org/resources/pubs/yc/nov2015/emergent-curriculum>

### 3. **Power of play, a playful pedagogy**

***Play is the highest form of research.* Albert Einstein**

Defining play is somewhat contentious, however these characteristics are more readily agreed upon: Play is pleasurable, intrinsically motivated, process orientated, freely chosen, actively engaged, and non-literal (ie involves make believe). Also contentious is the role that adults can take within the play, and whether or not they should intervene.

Play based learning is described in Early Years Learning Framework as ‘a context for learning through which children organise and make sense of their social worlds, as they actively engage with people, objects and representations’ (EYLF, 2009 p.46)

Different types of play include:

Creative play is play, which allows a new response, the transformation of information, awareness of new connections often with an element of surprise.

Object Play is play that uses infinite and interesting sequences of hand eye manipulation and movements.

Social Play is play during which rules and criteria for social engagement and interaction can be revealed, explored and amended.

Dramatic Play is play that dramatises events both real and unreal and the child is a direct participator.

Fantasy play is play, which rearranges the world in the child’s way. A way that is unlikely to occur.

Quiet play is play that is more sedentary but usually opens and stimulates minds.

Co-operative play is play, which allows children to play together and interact whilst playing.

Loco-motor play is play with movement in any or every direction for it’s own sake.

Mastery play is play, which allows control of physical environment.

Deep play is play that is risky and often these experiences conquer fear.

Dangerous Play is play involving risk taking where often participants are acutely unaware of the possible consequences.

Mildred Parten (1932) developed six categories of play and these play categories are still actively used by educators today. They include:

1. Unoccupied behaviour – not engaged in any activity

2. Solitary independent play – child playing alone, no other children within I metre

3. Onlooker behaviour- child observing others play but not joining in

4. Parallel play – child playing next to others without verbal interaction

5. Associative play – verbal interaction, but few attempt to organise the play situation

6. Co-operative or organised supplementary play – each child taking an active role to plan and structure the play situation while collaborating with each other.

Teachers can manipulate the environment and ‘coach’ students to move from one level to the next.

***The Discovery-based inquiry approach values*** both non-facilitated play (where the teacher does not intervene but watches, listens, interpretes, and facilitates further play by providing materials and opportunities and shaping the environment), as well as facilitated play where the teacher interacts with students at different levels and for different purposes.

There is great value in non-facilitated play and there is a time and place for it. However, Discovery is a time when students engage in learning in a ‘playful way’ and teachers play a strategic role in this. Teachers design or co-construct the environment with students and provide materials to facilitate different types of play or interaction. Play provides a context for learning opportunities and student-driven inquiries to ‘emerge’.

Discovery is a learning time where play is the entry point. As students develop their play becomes more intentional and eventually develops into an opportunity for more extended, student-initiated projects or inquiries. This happens through strategic intervention and shaping by the teacher. No matter where a child is though on this continuum, learning is always playful.

A ‘playful pedagogy’ is one that recognises that powerful learning happens when students are encouraged to play, wonder, explore, investigate and discover. This approach is applied in all areas (eg Literacy, Math, RE, Inquiry) and not just limited to Discovery.

**Research and philosophy that supports this principle:**

**Dr Rachael White: The Power of Play: A research summary on play and learning**

In play, children develop a lasting disposition to learn. Having control over the course of one’s own learning, as in free play, promotes desire, motivation, and mastery (Erikson, 1985; Hurwitz, 2003). Children also learn how to seek out knowledge; play involves exploration, hypothesis testing, and discovery. What is more, all this is done in a safe, anxiety- and risk-free environment where children are free to test the limits of their knowledge and abilities with relatively few repercussions (Hirsch-Pasek & Golinkoff, 2003). They learn to have confidence in their ability to solve a problem, and they become resilient in the face of a challenge (Erikson, 1985; Hurwitz, 2003; Pepler & Ross, 1981). Play builds the foundation for a lifetime of learning.

Many of these skills, first developed through play, are crucial for success in the 21st century. There is no doubt that amassing knowledge of the world around us continues to be important in our society – and playful learning can help children to learn content-based lessons, too (for a review, see Fisher et al., 2011). Increasingly, however, to achieve success in a global economy, the individuals that make up our workforce must also be socially adept and highly creative. The “6Cs” – Collaboration, strong Communication, knowledge of Content, Critical thinking, Creative innovation, and Confidence to fail and try again – will be essential to our children’s future success. Many of these skills are not easily taught in the classroom; however, they are readily learned through play (Hirsch- Pasek & Golinkoff, 2003; Hirsch-Pasek et al., 2009; Partnership for 21st Century Skills, 2008).

Read more: <https://www.childrensmuseums.org/images/MCMResearchSummary.pdf>

**Dr. David Whitebread: The Importance of Play; A report on the value of children’s play with a series of policy recommendations. April 2012**

Much of the contemporary work on children’s play within developmental psychology, however, has built on the influential theories of the Russian psychologist of the first part of the 20th Century, Lev Vygotsky (1896 – 1934) … His key insight as regards the role of play (Vygotsky, 1978) was that it makes two crucial contributions to children’s developing abilities, which relate to their development of language (and other human forms of ‘symbolic representation’) and to their developing abilities to control their own cognitive and emotional processes, or to ‘self-regulate’. The significance of this insight has become increasingly recognised as the evidence has mounted that these two abilities, language and self-regulation, are intimately inter-related (Vallaton and Ayoub, 2011) and together form the most powerful predictors of children’s academic achievement and of their emotional well-being (Whitebread, 2011).

In regards to language, Vygotsky argued that play makes a crucial contribution to the development of the unique human aptitude for using various forms of symbolic representation, whereby various kinds of symbols carry specific, culturally defined meanings. These forms of symbolic representation include drawing and other forms of visual art, visual imagination, language in all its various forms, mathematical symbol systems, musical notation, dance, drama and so on. Play is recognised in this analysis as the first medium through which children explore the use of symbol systems, most obviously through pretence. The co-occurrence in infants of the emergence of pretend play and the use of sounds to carry meaning (the beginnings of language) around the age of ten to fourteen months is widely reported, and clear support for Vygotsky’s analysis of the involvement of pretence in the early development of symbolic representational abilities.

Vygotsky went on to argue that pretence play becomes a ‘transition’ from the ‘purely situational constraints of early childhood’ to the adult capability for abstract thought. Children, he argued, require the support of real situations and objects with which to work out ideas through play. Thus play both allows children to consolidate their understandings of their world and facilitates their development of the representational abilities they will use to think through ideas as an adult. As further evidence to support this view, Vygotsky noted that certain types of children’s play (mostly play with objects and pretence) are often accompanied by self-directed or ‘private’ speech, where children are observed to self- commentate as they play. This phenomenon has been the subject of extensive and ongoing research within developmental psychology, and Vygotsky’s view has been consistently supported (Winsler and Naglieri, 2003; Fernyhough and Fradley, 2005). The production of private speech is extremely common during these types of children’s play and is clearly associated with episodes of challenge and problem-solving.

The role of play in supporting children’s development of ‘metacognitive’ and self-regulatory abilities is also an area of current research development. Metacognitive abilities concern our developing awareness of our own cognitive and emotional processes, and our development of strategies to control them. It is now clearly established that children begin to develop this awareness and control very early in life, that significant individual differences are quickly established which have long-lasting consequences for achievement and well-being, that these abilities are learnt, and can be taught, and that the various types of play form a powerful context for their development (Whitebread and Pino Pasternak, 2010; Whitebread, 2010, 2011).

Read more:

<http://www.importanceofplay.eu/IMG/pdf/dr_david_whitebread_-_the_importance_of_play.pdf>

### 4. The environment as the 3rd teacher

***Enabling environments ‘mobilise the energy, attention, curiosity and focus of children’* Howard Gardner**

Physical environments affect everyone’s behaviour. The notion of the environment as the ‘third teacher’ (along with children and adults) comes from recognising that there are many ways that the physical environment ... both indoor and outdoor, can either enhance or interfere with children’s learning and independence. The way the environment is set up and maintained contributes to the overall atmosphere of the setting, which affects children, families and educators. (Extract from: ‘Putting Children First NCAC June 2011)

Whether learning and teaching in a contemporary purpose built learning environment, or in an older building with more ‘traditional classroom’ structures, teachers have the opportunity to design and create spaces for maximum learning to occur.

If we design and create environments that reflect the beliefs and values we hold for learning we can enhance the potential for learning for our students. Likewise, if the environment contradicts our beliefs and values it can inhibit learning. For example if we believe learning happens in a social context, and we value collaborative learning then we need to create spaces where students can work together. If the classroom is set up with students in individual desks all in rows facing the board, it is in conflict with our beliefs and will make it difficult for students to collaborate. So we need to reflect on what we believe and value about learning and ask ourselves how the learning environment enables these beliefs to become practice.

The phrase ‘the environment is the third teacher’ was first coined by Loris Malaguzzi (Reggio Emilia). He was referring to the parents being the first teachers, the ‘teacher’ being the second, and the physical environment being the third. He was referring to the resources a child can draw upon to support them with their learning. Environments should be aesthetically pleasing as well as invite curiosity and autonomy, if we respect the dignity of the child. Aspects to consider when designing the environment can include:

* the tools and materials we make accessible
* colours (natural colours and pastels have a calming effect, bright colours can agitate students)
* the use of inside and outside spaces as many children are more receptive to exploring and investigating outside
* use of naturally lighting where possible
* opportunities to learn through all the senses
* the impact of over stimulation (eg too much colour, too many ‘wallpaper’ style’ displays, too many things hanging from the ceiling)
* furniture- a variety of different types and sizes of tables, chairs and other seating options
* interesting displays or provocations designed to build curiosity and wonder
* safety and calmness
* opportunities for quiet and for collaboration
* the use of natural materials (eg, wood, rather than plastic) wherever possible

In the work of Urie Bronfenbrenner he explores the concept of ‘bidirectionality’ in other words, the child impacts the environment and reciprocally, the child is impacted by the environment. Like with our learning and investigations children should be given a voice in the way the learning environment is designed and created.

***In the Discovery-based inquiry approach*** we value the belief that children learn in different ways (Multiple intelligences and 100 languages of children). Therefore the environment should support different ways of working in both it’s layout, and the materials and tools that are accessible for students at any time. If we believe in empowering students to become self-sufficient and self-managing learners they should be able to access the materials they need for their learning at any time. If we value curiosity and inquiry, there should be many interesting displays and artefacts to stimulate wonder.

**Research and philosophy that underpins this principle:**

**The Environment as the 3rd Teacher by J.C. Darragh 2006**

***How does the environment ‘teach’ children?***

**The environment as a teacher: Providing support for knowledge**

How can early childhood environment support children’s knowledge? Important environmental aspects of knowledge include providing information for the senses, supporting the unique needs and preferences of children, providing experiences that are content-rich, and which provide feedback.

**Environments should support learning through the senses.** One of the foundational principles of early childhood education is that the senses play a large role in children’s development, and that a carefully designed environment support children’s exploration through their senses.

How can environments take into account each of the five senses? Within the field, the areas of visual and tactile development often receive the most attention, with brightly colored objects and carefully selected objects for little hands to explore adorning the classroom. Certainly, the senses of sight and touch are important, but often uninformed choices are made about what best supports children’s senses, and not only is support for vision and touch misused, it often eclipses inclusion of sound, smell, and taste.

**Environments should support play and the learning needs and preferences of each child.** How can environments support children’s play and unique ways of interacting with materials as well as one another? The answer is as diverse as the multitude of different needs children bring within the classroom, but is as simple as keeping one important factor involved: well designed environments allow children to act. How children act upon the environment, what ways they choose to experiment, how they process the material within it—each of these factors are determined by the individual child, based on their own individual needs. A good environment, based on this, will provide children with a variety of options that support the varied explorations they might embark upon. This is supported by the work of “playeducation” specialists Cosco and Moore (1999), who argue that the richer and more diverse the possibilities offered to children within their worlds, the more children will gain in terms of knowledge, understanding, and the meaning of place and space in their own lives.

**Environments should be content-rich.** Not only it is critical that early childhood environments support children’s play and work, but environments also need to be content- rich. Within the field of ECE, there is growing concern that the academic approach--including the focus on literacy and numeracy skills—is often introduced before children are ready, and includes activities that are not reflective of children’s developmental needs.

The appropriate alternative to the academic approach, according to Lilian Katz (1991), is one that supports children’s developing intellectual skills. The process for supporting these skills includes the development of a child-directed environment that is both rich in choice and content. From this child-directed environment, children learn habits of mind that allow them to interpret experiences. It is this ability to interpret that Katz sees as a critical aspect of cognitive development, and the content-rich environment supports development of this goal.

**Environments should provide feedback.**

Children learn from their actions, and the environment serves as a vital teacher. For this learning to occur, environments need to be designed in such a way that feedback is cultivated, and just as teacher need to observe the effects of the environment on children, children need to be taught to pay careful attention to the feedback the environment gives them.

**The environment as a teacher: Support for the development of skills**

The volume of skills children need to learn during early childhood is daunting—not only are children developing fine motor skills for such tasks as writing and drawing, but they are learning how to physically navigate the environment, how to get along with others, how to communicate in ways that they are understood, different means of representation (including the written word) and how to utilize these skills to communicate ideas, and basic academic skills such as numeracy and letter identification.

**Environments should include a wide variety of tools and opportunities to practice and acquire skills**. Proper placement of tools and opportunities within the environment can provide a rich foundation for exploring, developing, and practicing the myriad of skills children are expected to develop.

(Eg.) Tools that support fine motor development might include having scissors, pencils, markers, crayons, paint brushes, beading, and legos, to name a few. For gross motor development, objects like balls, climber, and swings are important. Getting along with others and communicating to be understood can be supported by interaction in a language-rich environment. Therefore, opportunities for individual, small group, and large group activities with a teacher providing labeling, interpretation, and support can be effective tools. An environment rich with labels, pictures, and books can support the development of representation skills, with children being afforded many opportunities to represent their own ideas. Finally, basic skills such as letter identification can be supported through the print-rich environment, and opportunities for counting, exploring wholes and parts, and ordering can support basic numeracy skills.

Read more: <https://files.eric.ed.gov/fulltext/ED493517.pdf>

**If the environment is the third teacher what language does she speak? by Ann Pairman and Lisa Terreni**

A major influence on our thinking has been the work of early childhood educators from Reggio Emilia. We are interested in how the theoretical underpinnings of their approach has manifested in New Zealand and other Western countries. The influence Reggio Emilia programmes have had on early childhood educators’ thinking - in the design of educational equipment, use of colour, space and lighting in early childhood centres, and the growing awareness of the importance of aesthetics in educational environments, reinforces our own belief that the Arts and aesthetics education are integral to developing quality early childhood programmes.

We have titled this paper *‘If the environment is the third teacher what language does she speak?’* because we believe the early childhood environment gives children important messages and cues. In other words, the environment ‘speaks’ to children - about what they can do, how and where they can do it and how they can work together.

*“What is in a space, a room or a yard, and how it is arranged can affect the behaviour of people; it can make it easier to act in certain kinds of ways, harder to act in others. We don’t ordinarily think to take out a deck of cards at a dinner table set for six, even though the number and arrangement suggest a poker game. The whole setting gives us cues about expected behaviour, and generally we do what we have been invited to do...in a similar way, particular settings invite children to involve themselves in particular activities, and the extent of children’s constructive participation in the activity will depend in large part on how well certain concrete. Measurable aspects of the surrounding physical space meet their "hunger, attitudes and interests...”*

**Key aesthetic considerations**

It can be seen that consideration of aesthetics in the early childhood environment must include the careful organisation of space and often aesthetic and organisational considerations will overlap in many areas. We have identified several key aesthetic considerations that can be used when establishing and reviewing an early childhood environment.

**Colour**

* The internal colour scheme of a centre needs to create mood and define spaces.
* Use primary colours cautiously. Too many bright colours may make children distracted and agitated or cause them to shut down their senses.

**Light**

* Use natural lighting whenever possible – natural light is healthier and has varying qualities of illumination throughout the day.
* Avoid harsh fluorescent lighting – these can create agitation.

**Display**

* Display objects that arouse curiosity and wonder.
* Use both natural materials and found materials in the programme.
* Make sure materials are presented in an orderly and considered way.
* Reorganise materials once children have finished using them so they retain their appeal.
* Arrange and display objects in different ways so that children’s curiosity is aroused.
* Display a variety of art work or objects d’art in the centre – different styles, from different cultures, in different mediums e.g. sculpture, pottery, weaving, tapa cloth, art prints from the library.
* Display children’s work in careful and respectful ways. It is often better to highlight one or two paintings rather
* Display documentation – written and photographic, in a well spaced and orderly way, preferably at the children’s level.

**Sensory Experiences**

* Provide experiences, materials, and equipment that are sensory rich – visual, aural, tactile, and olfactory.

Read More:

<https://www.scoop.it/t/learning-environments-by-lyndsay-buehler>

### 5. Integrated teaching and learning

***How dare we divide the child's day into little parcels of knowledge. There is a whole child there!* Mr. Philips, 4th Grade Teacher quoted in ‘Interdisciplinary Curriculum by Heidi Hayes Jacobs**

Integrated teaching and learning is really about purpose and relevance. Real life learning happens in a holistic way. When both adults and children learn they draw upon and integrate skills and knowledge from a range of disciplines in order to make sense of the new learning. Although there are times when teachers need to isolate specific skills for explicit instruction, these skills will become embedded when students use them for authentic purposes. Learning in an integrative way enables students to make connections: between school learning and real life as well as across disciplines.

Immersing students in relevant and engaging experiences and topics give them the opportunity to use previously learned skills (explicit teaching) and understandings in purposeful ways. Conversely, engaging and motivating students in relevant and interesting content creates the need to learn certain skills in order to investigate their own questions and interests (just in time learning).

Integrating across the curriculum can mean:

* Making conceptual connections
* Linking content from different knowledge-based subjects (eg science and geography: environmental change, and history, civics and citizenship and intercultural capability: traditions and values)
* Using literacy, math and technological skills to seek answers and process thinking
* Using learner skills and dispositions (General Capabilities) across all learning situations
* Applying skill sets and processes (investigating like a…. scientist, historian, designer etc) that best suit the investigation
* Using literacy, arts and technological skills to express ideas and share knowledge

Dividing curriculum and learning up into discrete boxes on the timetable hampers teachers ability to teach in an integrative way, and restricts students in making connections. When teachers plan for learning in an integrative way they are able to help students make connections with their learning. Teachers can do this by:

* Knowing the curriculum really well
* Making connections across the curriculum when designing learning sequences
* Making learning visible and building in time for reflection and synthesis
* Being flexible with timetabling
* Making the most of learning opportunities as they arise (looking for teachable moments)

***In the Discovery-based inquiry approach*** we make connections across the curriculum whenever the opportunity presents itself. In particular we design teacher-initiated inquiries that are multi-disciplinary, and we design areas and provocations in Discovery that connect to learning in our integrated inquiry investigations, Maths, Literacy. R.E. and specialist subjects. In the Discovery-based inquiry approach we also value explicit teaching of Literacy and Numeracy skills in a focussed way as these skills are fundamental to being a successful in learning.

**Inquiry investigations**

When planning inquiry investigations we choose topics that are developmentally appropriate and interesting to our students and map these back to the curriculum. Many schools use a Conceptual Framework, or set of Throughlines to create a curriculum map for the year where connections across ‘content’ Learning Areas (eg. Science, Humanities, Health etc) have already been made at the whole school level. ‘Process’ areas (eg. Literacy, Maths, Digital Technologies, Arts etc) are then used to help students to find out, process their thinking, and share their ideas and understandings. These links are planned strategically and the skills students need in order to engage in the topic are taught explicitly.

**Discovery**

When planning Discovery teachers consider the learning that is taking place in other curriculum areas including; Inquiry Investigations, Maths, Literacy. R.E. and specialist subjects, when designing areas/stations and provocations. They make explicit connections to the learning that is happening in all areas of the curriculum to enable student to further explore their ideas and theories and practise skills and vocab they have already learned. Opportunities for reading and writing are encouraged at all areas/stations by the strategic placement of picture story books, reading materials, writing tools and ICT for specific purposes. Specific vocab is often added to an area as teachers hear students using the words, this can then be accessed during a writing session. Writing ‘workshop’ sessions are often held straight after Discovery as a scaffold for students who may be struggling to choose what they want to write about. Tools for encouraging mathematical thinking and reasoning are also added strategically to areas/stations such as: price lists, cash registers and money in restaurants and shops, tape measures in construction, clocks and appointment books into role play areas, patterns and colours into arts areas.

**Research and philosophy that underpins this principle:**

**The Nature of Learning: Using research to inspire practice. OECD Centre for Educational Research and Innovation**

**The 7 Principles of Learning.**

Principle 7: Building horizontal connections: The learning environment strongly promotes ‘horizontal connectedness’ across areas of knowledge and subjects as well as to the community and the wider world.

* A key feature of learning is that complex knowledge structures are built up by organising more basic pieces of knowledge in a hierarchical way. If well-constructed, such structures provide understanding that can transfer to new situations a critical competency in the 21st century.
* The ability for learners to see connections and ‘horizontal connectedness between the formal learning environment and the wider environment and society. The authentic learning also fosters deeper understanding.

Read more:

<http://www.oecd.org/education/ceri/50300814.pdf>

**Support for an Interdisciplinary Curriculum by Heidi Hayes-Jacobs in ‘Interdisciplinary Curriculum’ chapter 1**

What are some guiding beliefs and assumptions that will support an interdisciplinary curriculum attempt? The philosophy of the curriculum developer will always permeate the final design. I compare our work to architects who design a project based on a site, materials, and the population to be served. Sometimes in the course of carrying out the project there are unexpected events—a delay in materials, an immovable rock in the foundation—so the architect adapts the plan. But, initially, the architect brings a personal vision to the task. The more aware we are of our philosophical beliefs, the more likely we are to make responsible design choices that reflect a cohesive and lasting quality in the educational experience we are attempting to build. Consider the following beliefs and assumptions as you create your statement of philosophy for interdisciplinary work.

* Students should have a range of curriculum experiences that reflects both a discipline-field and an interdisciplinary orientation. I have hammered away on this point because of my concern that devotees of either position will claim “mine is the only way.” Just as pioneering artists like Joyce and Picasso could not break the rules until they had fully mastered them, students cannot fully benefit from interdisciplinary studies until they acquire a solid grounding in the various disciplines that interdisciplinarity attempts to bridge (Jacobs and Borland 1986).
* To avoid the potpourri problem, teachers should be active curriculum designers and determine the nature and degree of integration and the scope and sequence of study. The teacher's decisions will most directly affect students in the day-to-day running of the classroom. The teacher should be empowered to work as a designer, to shape and to edit the curriculum according to the students' needs.
* Curriculum making is a creative solution to a problem, hence, interdisciplinary curriculum should only be used when the problem reflects the need to overcome fragmentation, relevance, and the growth of knowledge.
* Curriculum making should not be viewed as a covert activity. The interdisciplinary unit or course should be presented to all members of the school community. Few parents will have experienced integrated curriculum, and they will feel less suspicious if they are well informed.
* Students should study epistemological issues. Regardless of the age of students, epistemological questions such as “What is knowledge?”, “What do we know?”, and “How can we present knowledge in the schools?” can and should be at the heart of our efforts (Jacobs and Borland 1986). The preschool child deserves to know why the room is organized the way it is, why there are “choice times,” and why there are set times for “group meetings.” Relevance begins with the rationale for educational choices affecting the school life of the student.
* Interdisciplinary curriculum experiences provide an opportunity for a more relevant, less fragmented, and stimulating experience for students. When properly designed and when criteria for excellence are met (Chapter 4, Ackerman), then students break with the traditional view of knowledge and begin to actively foster a range of perspectives that will serve them in the larger world.
* Students can and, when possible, should be involved in the development of interdisciplinary units. The four-step process described in Chapter 5 allows for student input in a meaningful way. It is not always desirable for students to participate, but student interest in the units is often enhanced by their involvement in the planning process (Jacobs and Borland 1986).

Read more:

[**http://www.ascd.org/publications/books/61189156/chapters/The-Growing-Need-for-Interdisciplinary-Curriculum-Content.aspx**](http://www.ascd.org/publications/books/61189156/chapters/The-Growing-Need-for-Interdisciplinary-Curriculum-Content.aspx)

### 6. Respect for each individual

***Our image of the child is rich in potential, strong, powerful and competent and, most of all connected to adults and other children.* Loris Malaguzzi (Reggio Emilia)**

As teachers our view of the child influences our words and actions, and the decisions we make about how we teach. If we believe children are:

* Innocent or Fragile - we think we must protect them
* Threatening - we think we must control them or the situation
* Empty - we think we must teach them everything
* Competent and capable - we think we must challenge them, trust them with their learning, listen to their perspective

(Lisa Burman 2018)

When we view children as competent and capable we empower them to take ownership of their learning. When we recognise that children learn in different ways, and when we are are inclusive - valuing the diversity of each child; culture, interests, talents, learner traits and qualities, every child is given the opportunity to be successful in their learning. Children thrive in an environment where they feel accepted and valued for who they are and how they learn.

***In the Discovery-based inquiry approach we value*** relationships and the individuality of each person. We take time to have personal conversations with each student as well as learning conversations. During Discovery one of the most important roles of the teacher is to have one on one conversations with students. We encourage them to tell us about themselves, their families and their interests and try to ensure every child has the opportunity to explore their own interests during Discovery. We create open-ended opportunities so every student can enter into the learning at their own level. We explicitly teach learning dispositions to strengthen children’s capacities and belief in themselves as learners.

In inquiry investigations we find out children’s prior knowledge before commencing a topic, and plan a shared experience that will enable all students to enter into the learning. We give them opportunities to explore their working theories and express their understandings using a variety of mediums encouraging children to make choices about their own learning.

### 7. Look, listen and learn: Assessment for learning

***‘Weighing the pig doesn’t make it fatter’.* Traditional**

The traditional saying ‘Weighing the pig doesn’t make it fatter’ in educational terms alludes to the fact that testing, assessment and data gathering is useless unless it is analysed and acted upon. Assessment for learning is the term used when assessment is part of a teaching and learning cycle that involves:

* collecting assessment information about a student
* analysing the information
* acting on the analysed information in order to improve student learning

The Reggio Emilia approach encourages the notion of ‘teachers as researchers’. If we consider ourselves to be researchers constantly seeking to find out more about our students; how they learn, what they know, what their misconceptions are, what they can do, then every interaction we have with our students can be an opportunity for us to learn more about them. Assessment doesn’t have to involve stopping and stepping out of a teaching cycle, every learning sequence is an opportunity for assessment. However, we must know what we are looking for and what the developmental sequence of learning in an area looks like.

There are many powerful ways of finding out about what our students know and can do. These include:

* Listening (learning conversations or ‘eavesdropping’ during activities requiring collaboration)
* Watching (guided observations)
* Interviews
* Open-ended tasks (show me what you know now using any medium)
* Diagnostic testing
* Analysis of work samples
* Self-assessment checklists/rubrics
* Peer assessment checklists/rubrics

What is important in each of these examples is that teachers attend to the following questions:

* What are we looking for
* How will we record it?
* What does this mean (analysing information gathered)?
* What will we do with the information?

In order for teachers to analyse and act on the collected information it is imperative that they understand the developmental sequence of learning in that area. We need to ensure that the assessment we spend time on is assessment that gives us quality information- many assessment strategies may be easy to administer but may gie us low quality information. Another consideration is what to assess. If we believe that we value what we assess; and we assess what we value, we need to focus on not just the things that are easy to assess, but those things that we feel are important but a little harder to assess, such as learning dispositions and inquiry skills.

Assessment should be ongoing and not seen as something that is ‘done’ at the end of a teaching and learning sequence.

***In the Discovery-based inquiry approach*** we view every learning opportunity as an assessment opportunity. We consider ourselves to be researchers and are constantly striving to learn more about our students. Assessment is viewed as ongoing and takes many forms.

During Discovery learning conversations as well as listening and observing are seen as the best methods of gathering information. Documenting observations is always problematic. We want to capture what we are seeing and hearing but don’t want the recording to detract from being present to the child in the moment. Teachers experiment with the best methods of recording to suit their context. Knowing what you are looking for can help focus the observation. There are so many aspects of a child’s learning and development that reveal themselves during Discovery that it is impossible to capture everything, so identifying a focus is important. The potential for focus is huge. It could be oral language, social skills, learning dispositions, conceptual understanding related to the inquiry investigation, or a myriad of other elements. The important thing is to choose a focus. The focus can and will change over time but gathering specific information is much more valuable and useable.

Methods of recording assessment information can include; checklists, anecdotal records linked to criteria, photographs, video clips and learning stories. Tools to assist with this recording might include google docs, apps like storypark or seesaw, handwritten checklists, post it notes for anecdotal records- there is no one best strategy and everyone needs to find the method that works best for them.

When assessing children’s understandings through the inquiry investigation it is important that we allow children to demonstrate their understandings in a way that enables them to fully disclose their thinking. If we insist on children writing what they know now we immediately restrict some children from giving us a clear picture of what they now know. By giving them a choice of how the demonstrate their understanding we are much more likely to gain a true representation of their thinking. By asking them to show us in more than one way we actually verify what we think they know with more than one form of evidence. We should never underestimate the power of asking children to tell us what they are thinking.

Teacher questioning is often the key to unlocking what is inside a child’s mind. When we write understandings and questions at the beginning of an inquiry investigation it is important that we revisit the questions with students during and at the culmination of the unit.

### 8. Feedback enhances achievement

***The most powerful single modification that enhances achievement is feedback.* John Hattie**

Closely linked to ***number 7 Look, listen and learn: Assessment for learning*** is feedback. When teachers gather critical assessment information about a student and share it with the child they empower students to take ownership of their learning. They provide expert guidance on not just where the student is in their learning but what they can do to take the next step. If we believe that learning is most powerful when students take responsibility for their own learning we need to give them the tools to be able to do this. We do this by giving them honest and authentic feedback.

Feedback can support students in identifying their strengths and achievements as well as areas they can improve. Most importantly it can help them to know how to improve. Feedback needs to be timely, specific, and constructive. It can occur at any stage of the teaching and learning cycle, but most importantly students have to have the opportunity to act on the feedback and be able to track their own progress with support.

Opportunities for self-assessment, reflection, self-monitoring and evaluation in relation to a criteria are crucial in this process. A consistent cycle of reflection and feedback supports goal setting which are a great motivation for students.

***The Discovery-based inquiry approach values*** a teaching and learning cycle that incorporates ongoing reflection, assessment, feedback and goal setting. This is done through learning conversations and ‘noticing and naming’ desirable learning behaviours and dispositions. Children are encouraged to set goals and give each other verbal feedback when they observe each other displaying behaviors and skills that have been identified as ‘good learning’. Teachers make ‘good learning habits/dispositions’ or specific skills visible by creating criteria (what does this look like/sound like/feel like) as well as by demonstration.