

Introduction

My sabbatical question:

How can we improve our processes and programmes to support, engage and meet the complex needs of our 5 and 6 year old students?

Pegasus Bay School is a new purpose built 'Modern Learning Environment' school. We are growing quickly and last year had 132 enrolments of which 88 were 5 year olds. I have had increasing concerns about the performance and readiness of our 5 year olds at school.

In a recent analysis of North Canterbury Schools achievement data, 40% of 5 and 6 year old children were below the expected academic standard. 4 out of 10 parents hopes are quickly dashed when they hear that their child is "below standard" within the first year or 2 years. This is not the start they envisaged or what teachers had hoped for.

Who is this report for?

This report is written for teachers and parents as a discussion document to look at the needs of our tamariki, the challenges of the education system and how we move forward in a planned and purposeful way. For those who have the patience to read this report in its entirety – well done, you will know how passionate and sincere I am about addressing the needs of our youngest pupils. By the end of this report you will be challenged and see how complex and urgent the need is to reshape what we offer our 5 and 6 year olds.

There have been a lot of changes to our education system over the past decade. This report reflects on these changes as well as research so Pegasus Bay School community can reflect and respond to its enrolment process and the learning environment and opportunities we offer our 5 and 6 year olds. We need meaningful, informed, big picture discussions about creative solutions and engagement strategies for our youngest pupils.

Here are 3 main issues I want to examine closer...

- School starting age
- What does research say about brain development for 5 and 6 year old children – can we make them smarter?
- How does this relate to what needs to happen in the classroom for children?

Why do children start at 5 years old in New Zealand?

New Zealand is quite unique in both starting school at 5 and starting school on their birthday. In New Zealand children do not have to start until they are 6. We are one of the few countries that start children so young.

56 countries, including New Zealand, are part of the PISA (Programme for International Student Assessment) study. Of these 56, only 4 countries have a school entry age under 6.

Age of entry to school (in years) in 56 countries (Suggate, 2009)

School entry age (in years)	Number of countries
4 years	1 country
5 years	3 countries
6 years	33 countries
7 years	19 countries

Our children in New Zealand are starting earlier than most children in the world. So why do our children start earlier? There are 2 main reasons – children’s cognitive level and secondly, a historical ‘hang-over’ from World War 2.

Piaget is a really important theorist in child development, especially his stages of cognitive development. His theories are one of the main reasons why we start school at approximately 6 years old and why we finish school at 18 around the world. Children reach the ‘Concrete Operational’ stage at age 7 and this is when they are more receptive to more formal learning such as numeracy and literacy. Most children around the world start school at 6 so they have a year to gather the social and emotional skills needed to cope with a large group of children, away from their parents, cope with new expectations etc. as it is important that they start these skills before they start more formal learning.

During the war when there was a labour shortage, women were needed to do the “men’s jobs”. So most western world countries reduced the school starting age to 5 to allow more women to enter the workforce. After the war most countries put the starting age back to 6, in line with accepted research, but New Zealand kept it at 5.

Our children in New Zealand are starting earlier than most children in the world. Because of the pressure of National Standards on schools for 5 and 6 year olds our children are being assessed against tasks which the last 300 years of research say is 7 year old behaviour. *(Some children are absolutely ready at 5 and I will talk about this later in my report.)*

Most children in New Zealand start on their 5th birthday after some pre-entry visits. Many 5 year olds have limited social skills so to start by themselves can be daunting and children can feel isolated and anxious. Starting school with a group of children would alleviate a lot of tension, as children would have immediate peer support and a social network. Schools and their communities, now have the decision when to start our intakes of New Entrants. Depending on the consultation outcomes, children may be able to start at a school with group entry at the beginning of the term closest to their fifth birthday, or the beginning of a later term. The government are pushing for children to start even before their fifth birthday (<https://parents.education.govt.nz/primary-school/your-child-at-school/cohort-entry/>) and those cynics out there may say that this stance is because it would save the government \$11.4m in 20 hours paid Early Childhood Education care. Each school community needs to come to its own decision after consultation.

For parents reference... A child must attend school from the age of 6. The last day that the 20 hours paid Early Childhood Education care can be claimed is the day before your child turns 6. The financial assistance doesn’t end at their 5th birthday.

We have established that New Zealand is a long way outside the norm in regards to when children start school. So what about the research around what young children need?....

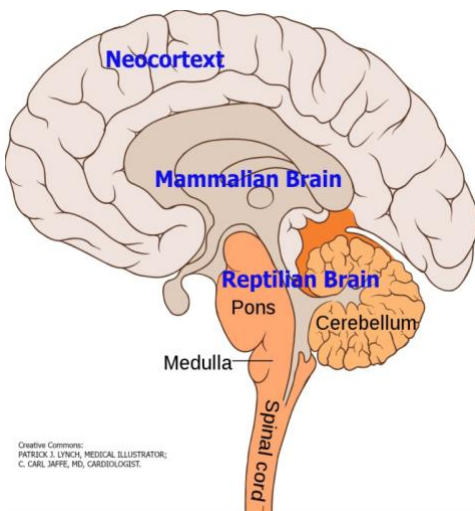
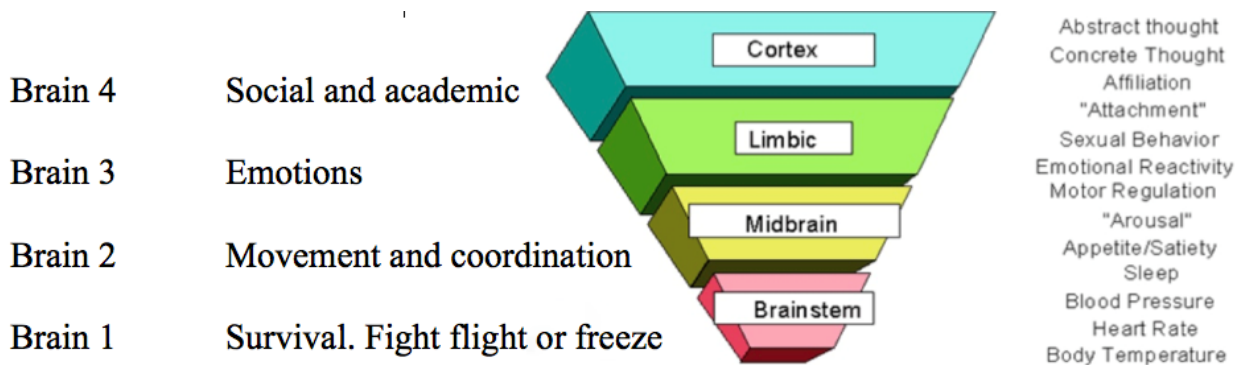
What about Neuroscience and what the research says for young children?

In the 1990's the floodgates opened as far as our knowledge of the brain and how it works with the advent of MRI and CT scans. These are magic machines that can see inside your head and body while you are still alive. This gave researchers insights into how brains work and how we acquire knowledge (cognition).

New Zealand is lucky to have Nathan Makaere Wallis who is a leading light in this area. He says that there are 2 main factors that make children's brains grow faster – their gender and being first born. It is a well known fact that female brains develop faster than males.

First born children's brains grown faster and they have a distinct advantage over their siblings because they reap the benefit of the one on one time with the primary caregiver when they were a toddler. A lot of where your intelligence comes from is the information toddlers gather in their first 1000 days. 99% of that data comes from the face of the primary caregiver. Simply put, according to Wallis and his research, the more face to face minutes and interaction there is, the more successful your child will be... higher qualified by age 32, higher earning by age 32 etc. The advantage of first born is significant. BUT the greater the time the major caregiver spends in front of other siblings the greater their chances will be too as well. The first 1000 days are so important because of the major brain growth that occurs at that time. The human brain is the only organ really underdeveloped when children are born. It doesn't catch up to the other organs in your body until you are 3. When a baby is born its brain weighs 350 grams. By the time the child is 3 the brain weighs 1200 grams and doesn't grow much more as an adults brain only weighs 200 grams more. The importance of the first 1000 days of a child's life is unquestionable.

The research about brain function in children is really interesting. Brains have four main levels.



Brains always work from the base level up. For example, you cannot go higher unless the needs of the 'lower' levels are met....you cannot go to Brain 3 if the needs of Brain 1 or 2 sending alarms.

Brain 1... Is your heart beating? Are you in danger? This part of the brain ensures you can react and survive. One of the core needs of Brain 1 in humans is physical attachment with that significant caregiver as this is our main survival technique. Without strong attachment, the movement and coordination stage can be delayed or won't develop normally. To move to

the next Brain level a child needs to feel safe.

Brain 2.... This part of the brain controls movement/coordination. There has been a lot of research about this area and it has been found that movement and learning are strongly linked yet our children spend so much time sitting still, focus when learning requires movement. It takes 50% of frontal cortex capacity for many children just to stay still and focus for any length of time. Being still when you focus is a really embedded behaviour and expectation from teachers, children and parents, but it is not what the neuroscience research is saying.

Brain 1 and 2 is known as the Reptilian Brain. A reptile has to think only about survival and movement and that is it.

To move to the next brain level a child needs lots of time and opportunity to crawl, walk and run so motor skills can develop.

Brain 3...

Terrible 2's are children with a range of emotions but with no idea of how to control them (this comes from Brain 4). By age 3 and up there is some ability to control their emotional response. The brain is clever for what it allows us to do but it is even more clever for what it stops you doing e.g. checking your emotions. A 2 year old gets angry and hits out. No matter how much we try to tell them "No" it takes higher order thinking to want to hit someone/something BUT then decide not to.

Brain 1, 2 and 3 collectively is known as the Mammalian Brain. For example, your dog operates in these levels Survival, Movement and Emotion. Your dog is really excited to see you because they have emotions but they are never going to learn to read because this needs a developed Frontal Cortex or Brain 4. Most 2 to 7 year olds operate in the Mammalian (or Limbic) brain.

Brain 4... Brain 4 is what makes us clever – language, higher intelligence, understanding consequences, focusing attention, empathy and academic learning at school. Simply put though, Brain 4 isn't operational or functioning well if there are needs or threats coming from Brains 1, 2 or 3.

Teachers, and parents, need to remember that you cannot work at the Brain 4 level if the needs of Brain 1 or 2 or 3 have not been met.

A quick recap...

There are some 'givens' that we need to realize before we move on.

1. Girls develop faster than boys
2. Research shows that first born children have a significant advantage over non first born children.
3. Children need to have the feeling of safety and attachment before any learning takes place.
4. The first 3 levels of brain function need to be addressed before we even think about any cortex activity e.g. reading maths and writing.

How does this relate to what needs to happen in the classroom for children?

Whether a child is in a Single Cell classroom or Modern Learning Environment there are 4 main factors that need to be part of everyday life for our children.

1. A meaningful relationship with their teacher

Class life needs to be safe and predictable. The number 1 factor in how well a student does in class is about the quality of the relationship with their teacher. A student is naturally calmer in the company of a teacher who values them and the student values.

“You need to be accepting, to be warm and to be nurturing. You need to be aware of and empathetic to their thoughts and feelings. You need to let them know they are important to you. And, to do all of this, you need to take the time to be mentally present with them throughout the day.” Angela Maiers (<http://www.evidencebasedteaching.org.au/>)

The keys to caring relationships (whether it be in the classroom or at home) = Warmth + Empathy + Time. I want to add + Boundaries as well. Children respect and need boundaries that are consistent and known.

In an MLE environment teachers need to work even harder to establish the meaningful relationships with students. There is a danger of 3 teachers having surface relationships with 80 children – if this happens then teachers and school systems are failing. Teachers need to be really clear about their roles within their Learning Community. Their role is ‘Mother/Father’ to their home group and ‘Aunt/Uncle’ to the other children. You need to spend quality time daily as a homegroup so the homegroup teacher knows their children well as individuals, what do they like, don’t like, do in the weekends, who they play with at playtime and any hassles they are having. A ‘mother’ role is an active, knowledgeable advocate and supporter of each of their homegroup children. Aunts are active and supportive but don’t have the same level of knowledge as the Mother/Father. Any situations that arise it’s the Mother/Father that sees it through and ensures nurture and full communication – just like a real Mum or Dad.

So how do we integrate this into our practice... perhaps 1 homegroup teacher that moves with children for the first 2 years at school, perhaps meeting every morning for 30-60 minutes to connect and have some learning revision. Even ‘play-based learning’ time or Action Stations need serious ‘connecting’ time first.

2. Rhythmic Pattern established

What happens when babies are upset - they get rocked. Rhythmic patterns are soothing and lower the heart rate. There needs to be a rhythmic pattern established within school life for children. This means a consistent pattern / programme that is predictable and communicated. It also means regular times during the when rhythmic pattern activities are taking place – this could be Waiata, Kapahaka, dance, Jump Jam, rhythmic literature e.g. nursery rhymes, poetry. In PE it could be swinging, inside there could be a rocking chair - outside there could be a hammock.

Alice Weaver Flaherty, one of the most renowned neuroscientists says that events such as warm showers, exercising, driving home, etc. make us feel great and relaxed and therefore give us an increased dopamine flow. I’m not suggesting letting all our 5 and 6 year olds take lots of showers at school or even drive home but we need to look at activities that create the **dopamine flow**: The more dopamine that is released, the more creative we are, she says:

“People vary in terms of their level of creative drive according to the activity of the dopamine pathways of the limbic system.”

The rhythmic activities above do this, as do programme breaks that help children relax. Mindfulness is a growth industry and justifiably so. Along with helping creativity time and allowing ideas to germinate, purposeful mindfulness programmes give children personal skills to help themselves in times of stress or tension. Mental health issues and levels of tension and hyper-arousal with children especially in Canterbury are at never seen before levels. Resources such as Sparklers <https://allright.org.nz/tools/sparklers/> need to be used and promoted in each school.

3. Children need to have a positive disposition of themselves as a learner

Children need to be working in their Zone of Proximal Development (Vygotsky). ZPD is the difference between what a learner can do by themselves and what they can do with help. To be put in a situation where the learning is too hard and failure is repeated then children feel helpless and ‘stupid’.

One of the dangers here is the constant reinforcement of an assessment based system like National Standards rather than a researched curriculum like Te Whariki

(<http://www.education.govt.nz/early-childhood/teaching-and-learning/assessment-for-learning/kei-tua-o-te-pae-2/>) which is so much more holistic and ‘citizen building’ with assessment and expectations for our 5 and 6 year olds around belonging, well being, exploration, communication and contribution. There should still be time for reading, writing and ‘rithmetic but for our 5 and 6 year olds there needs to be a change in what we do.

If children are forced into work that is always too hard they will disengage and this is where some of the behaviour issues come from. For boys – there is more mana in being naughty than being seen as ‘stupid’.

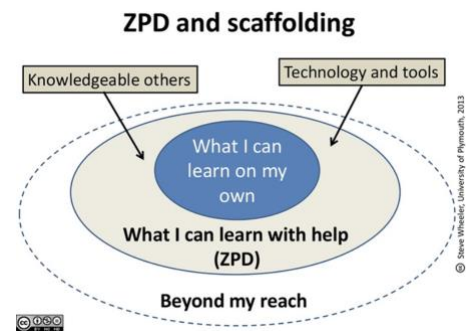
Why is it mainly boys you ask? Let’s quickly go back to Page 5....

1. *Girls develop faster than boys*
2. *Research shows that first born children have a significant advantage over non first born children.*

Girls who are first born have a double advantage and these children start school at age 5 roughly with a cognitive ability of a 7 year old. A boy who is not first born comes to school with a cognitive ability of roughly a 3½ to 4 year old. Yet our National Standards sees them all the same. That is why 40% of 5 and 6 year olds are ‘failing’.

It gets even more interesting though because in our western culture where some of our children have the needs of Brains 1, 2 and 3 met, why not ‘pre-load’ them e.g. proud parents come saying, “She is so ready for school she has been reading and writing for ages”. When this child starts school the teachers, peers and national standards all reinforce that the child is clever. Parents think this is a major step to academic and wider success at school. This is logical, but is completely wrong – there is no research to back this up. There are various research studies about children who come to school with advanced numeracy and literacy skills. What they show is that these children are caught up to by their peers by age 8, on average. Early cognitive attainment has no lasting effects. Research shows that before age 7 children need this ‘positive disposition to learning’. **What matters in not how clever the child is – but how clever they think they are!!!** This is about recognizing different types of ‘clever’.

With Brain 3 each child needs a positive disposition to themselves as a learner BUT also to their culture. We need to make sure children’s cultures are celebrated and seen as special. For Maori



students it is especially important for them to be proud of their culture. If teachers don't use any Te Reo because they don't want to do 'any damage' e.g. mispronunciation, then you are part of the problem not part of the solution. What counts is your effort so you give a place to the culture within your Learning Community.

4. Thinking smarter and 'Executive Functions'.

In the New Zealand Curriculum there is a strong focus change from knowledge and facts learning to the Key Competencies.

The Ministry of Education say,

Children are learning a range of skills and abilities (key competencies) to help them to do well in life. The world children live in is very different to what it was like when we were growing up and is continuing to change. It is no longer enough to just learn "facts". Our children will need to develop a range of key competencies, so that they can adapt and function well in the world.

These New Zealand Curriculum key competencies are:

- Thinking
- Using language, symbols, and texts
- Managing self
- Relating to others
- Participating and contributing

The next development may be to move on from the KC into the Executive Functions. Executive functions are brain-based cognitive skills that facilitate critical thinking and self-regulation. Executive functions call upon the prefrontal cortex of our brains to help with goal-setting and decision making. These skills include flexibility, focus, organization, planning, self-awareness, self-control, time management, and working memory. Educating children used to be about giving them facts and information

Play-based learning

My staff know that when they mentioned 'Play Based Learning' I used to groan out loud and roll my eyes. No, not a fan at all! BUT after this sabbatical I have not only seen the need but want it to become a major part of what we do at our school. Peter Gray said,

"Play is nature's way of teaching children how to solve their own problems, control their impulses, modulate their emotions, see from others' perspectives, negotiate differences and get along with others as equals. There is no substitute for play as a means of learning these skills. For life in the real world, these lessons of personal responsibility, self control and sociability are far more important than any lesson in the classroom."

The aim of the play based program is "to promote a sense of wonder, exploration, investigation and interest in a rich range of materials, resources and opportunities in which the child can engage." (Walker, 2007). Play experiences can come from children's interests or learning provocations from the teacher. A successful PBL programme allows children's different strengths to be recognised and developed so holistic skills are built, discussed and valued as part of deliberate instruction and learning outcomes.

Our children have more structure and organisation in their lives than ever before. They get fewer opportunities for play within their classrooms, whether it is free play, supported play or purposeful play. We know the social, emotional, intellectual and cognitive benefits of play based-learning. A teacher who is a PBL advocate writes...

“It was only 15 years ago that we could go into any Year 1 classroom and find children playing with play-dough and creating the most spectacular creatures, painting a masterpiece or gluing together toilet rolls to make a spaceship. They were engaging with each other, negotiating, sorting out arguments and establishing friendships. They were imagining, exploring and inventing. It was through taking risks, discovering new ideas and putting these ideas into action that learning took place.

Now it seems such acts of play are a thing of the past. We walk into a typical classroom and find containers of maths equipment that only come out at maths time, musical instruments gathering dust while they wait for the designated timeslot to learn percussion and Lego in buckets under the reading shelves waiting to be used on rainy days.”

We all nod our heads and agree but if it was that simple then most junior classrooms would be developing a far more PBL approach. I read this response from a teacher regarding Play Based Learning that is well written and sums up many points....

“I do all of this stuff and it is a battle (and a huge expense from our own pockets) because we have pressure to get children to national standards in reading, writing and maths with a very prescribed way to do it. It is soul destroying. Teachers know their tamariki need to play more but our hands are tied with having to collect evidence to prove you are working on national standards. We have very very measured and overly assessed target groups in all of these areas, We spend hours planning how to fit everything in, entering data, and blogging evidence. We are exhausted and unhappy - you try being creative under these conditions. We hate it and we want them to play more - WE KNOW our children need to play.”

National Standards

National Party's 2007 Education Policy, "National Standards will give schools from Kaitaia to Bluff a set of shared expectations about what students should be achieving as they move through primary school. Teachers will use national standards to clearly identify students who are at risk of missing out on basic skills and becoming a permanent part of the "tail" of under-achievement."

Teachers would support quality student achievement indicators but the current National Standards are poorly designed and even more poorly understood. These N.Z. National Standards are an incredibly subjective, poorly designed set of indicators that started out with reasonable intentions but continue to fail and be a major stumbling block to the NZ Curriculum for a whole lot of reasons.

That said we have to use them because we are forced to do so. At Pegasus Bay, our students from Year 4 up, achieve approximately 90% at or above the NS. There is no cause for concern although we are always striving for better. One of the strategies we want to explore is to not have NS for our Year 1 and 2 pupils. There would still be assessments and reporting to parents, just not against the NS. I asked the Ministry of Education if we could explore this and stated how well our Year 4 up data tracked. The response was emphatic... There is no lee-way Roger, just play the game!

So as Principal I have a dilemma of asking staff to move to a more researched, holistic framework of education e.g. PBL but at the same time I need to ask them to continue to do all the NS assessment and reporting. The teacher's comment above keeps ringing in my ears... *"We are exhausted and unhappy - you try being creative under these conditions."*

Where to from here?

Are we committed to changing our approach for our 5 and 6 year olds? Often when the going gets tough, people just get conservative. Ken Robinson sums up the need for change in this quote,

"I think that's very important because I'm convinced there is a need for profound change in education. That's something in the culture — at least, the political culture — of education. There is pressure on the system that gets in the way of what people most urgently need to do in schools to make them more humane and more personal places.

But the dominant systems — for the most part, perpetuated through public policies for education — tend to perpetuate practices which are unhelpful for most kids in the way they want to learn, or certainly in helping them discover what their real personal individual talents and abilities are."

We can't leave it to the Ministry to be the leaders in this area so each school needs to respond to this research as it sees fit.

There are a few provisos though.

- 1 In Pegasus Bay we won't call it Play Based Learning. In my eyes, that label is a marketing nightmare and undersells the importance of the programme. Perhaps "Springboard time"... time exploring skills and situations that help build skills and attributes in our young children like...
 - a knowledge of well being and what makes them happy.
 - a sense of belonging and being valued.
 - satisfaction and skills in contributing and being a friend.
 - skills in communication – oral and written.
 - having curiosity and persistence to explore and explain.

- 2 We need to be really clear about the intent and outcomes so that the language of what they are learning is clear and celebrated as important. Te Whariki is a document that is pure gold and needs to be close to the center of what we do. The ‘outcomes’ need to be part of the reporting system to parents as indicators of holistic success and what is valued.
3. The teachers’ roles in PBL need to be really thought through and training given. Some teachers roles are to be instinctual, motivating, guiding. Other teachers need to become researchers, observers, watchers reading the children’s development, psychological processes and/or cognitive studies and think about how to better support the child in their process.
4. There needs to be a well considered balance in delivery between the current literacy and numeracy focus and the PBL.
5. Build on the experience of others. There are other schools who are moving into play based learning, some well and some not so. Our teachers need to learn from visits and experience. We also need to realise that PBL is not a franchise, we can’t just pick a system and import it. Any Pegasus Bay PBL needs to be developed in response to our children’s needs, opportunities within the local environment and ensure teachers have the development needed to do it well.
6. Parents need to be taken on the journey too. Below are comments from paraphrased from an article from Sarah Aiono from www.longwortheducation.co.nz

“One of the biggest perceived barriers schools face when choosing to implement a learning through play approach is a fear of the response from their parent community. Parents may believe that the school, in adopting PBL will ill-prepare their children for the for future schooling and therefore the world of employment in the future.

Research demonstrates that children who learn through play and are self-directed in their learning have increased rates of motivation for school, along with other well-documented benefits such as increased self-efficacy, confidence and resilience. Anecdotally, parents of these kids tell us that their children can barely stop for a kiss goodbye at the school gate. They enjoy seeing their children run towards their classroom already with plans afoot for their morning of learning ahead.

More and more parents recognise now that while reading, writing and maths are not the only important tools for success, many more want to know that their children are liked by others, can play cooperatively, can manage themselves independently and responsibly and can overcome problems and challenges. They now see that in the 21st century, these skills of flexibility and adaptability can supersede basic skills of literacy and numeracy. In other words, children who grow to be kind adults, flexible problem-solvers, independent, resilient and responsible are more likely to be successful in the workforce and life.

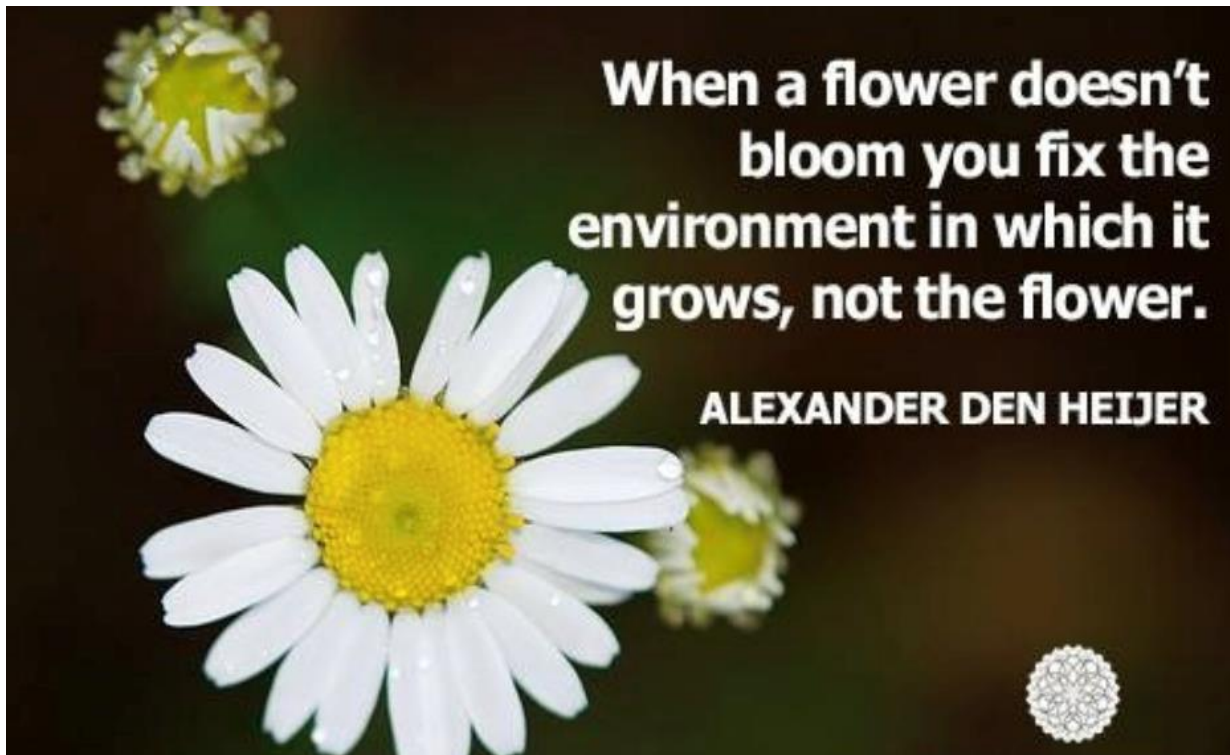
Conclusion

Neuroscience researchers such as Alice Weaver Flaherty, New Zealand’s own guru, Nathan Makaere Wallis, and world renown experts such as Ken Robinson are really clear about the urgency for the change needed in our classrooms.

When I started this journey I put out an email to North Canterbury teachers to meet with me and discuss concerns they had about Year 0-3 students in their schools I had hoped for perhaps a dozen to come to the meeting. I had nearly 80! There is a groundswell of concern, a groundswell of problems and a groundswell of frustration and almost helplessness with the system and the support we aren’t getting. When you couple this frustration with the fact that 40% of our 5 and 6 year olds are below standard in North Canterbury in Decile 7-10 schools then the problem nationally must be so much worse.

My sabbatical travels took me to Otago University to speak with Professors there. They felt this whole issue warrants national discussion, as the research is overwhelming. The problem is that the Ministry don't want the discussion and often even compelling research takes up to 40 years to become mainstream.

Being Principal or a teacher is an incredibly privileged position, having the ability to positively influence lives every day. The frustration is when your passion is being eroded by a system that is getting further away from meeting the children's needs. Things need to change urgently to give our 5 and 6 year olds more fulfillment and success in education.



Extra for experts.....

2 really well known oldies but goodies from Sir Ken Robinson that are always worth a watch -

https://www.ted.com/talks/ken_robinson_says_schools_kill_creativity/transcript?language=en#t-1144102

https://www.ted.com/talks/ken_robinson_changing_education_paradigms