Improving Student Achievement using Social-Psychological Factors

Sabbatical Report

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Introduction

The genesis of this short study is a report I came across a few years ago entitled: *Teaching adolescents to become learners. The role of noncognitive factors in shaping school performance: A critical literature review*. (Farrington, et al., 2012). I was enthralled. I thought, "Why haven't I read about this stuff before now?" I found myself being excited and frustrated at the same time.

I scanned through the report, reading bits here and there, before the daily life of a High School Principal took over. The ideas kept resurfacing though, and I would periodically delve back into the report and use it as the basis for some more thinking, or a discussion with various staff members.

Over the next 18 months three more key ideas resonated with me: the work of Carol Dweck on the Growth Mindset (Dweck, 2006): a brief reference I read about the work of David Yeager and Gregory Walton with regard to Social-Psychological Interventions in Education (Yeager & Walton, 2011): and the Brain Science research presented to us by Nathan Mikaere-Wallis when he so generously fitted us into his schedule last year. To me, these lines of thought all seemed to fit together.

So when it became my turn to apply for a Principals' Sabbatical, I didn't have to think twice to decide how I would spend my study time.

Methodology

At the beginning of this project, I spent a fruitful three days at the University of Otago as a guest of Assoc. Prof. Ross Notman and his team at the Centre for Educational Leadership and Administration.

This allowed me to plot out my line of inquiry and to test a few ideas in discussion with Ross and other members of the University staff. Most importantly, I received valuable assistance in how to search out the articles and journal references I was interested in.

I amassed quite a stack of articles and several books. As I read through this material I jotted down some brief notes and gave the work a mark out of 10. Some articles were read very thoroughly and others less so. The grading was purely subjective, based around my assessment of how relevant it was to the topic.

Every few days I would summarise my learnings; just one side of an A4 page, a new one each time. Then, when I had run out of time for reading any new information, I gathered the top scoring material and went through it again, looking for ways to link everything together in my mind.

I hope these threads hold together in the report that follows.

Purpose

This was an opportunity for self-reflection and to follow my own educational interests. Certainly I hope that there will be useful outcomes for our growth at Gore High School and I am excited about the learning as it applies to me personally. Beyond that, I hold few expectations. There are academics the world over who have carried out rigorous literature reviews on these topics and they will, I trust, continue to do so. Forgive me then, for writing in a more relaxed and personal style, and for venturing an opinion from time to time.

Improving Academic Achievement: A way forward

In the last four decades, New Zealand teachers and administrators have tried many things in order to improve the achievement of students in their classrooms. We have tried structural changes: period lengths; different timetables; structure of the school day; the governance of schools; trades academies and different types of schools. We have changed the curriculum, and we have completely reorganised assessment. We have put a lot of effort into growing our pedagogy; reflective teachers are continually working on honing their skills in the classroom. We are more accountable than ever, with appraisals, Registered Teachers' Criteria and schoolwide PAI (Public Achievement Information) reports and National Standards data, amongst other things. We have vast amounts of data on each student and the individual is in much clearer focus than at any previous time.

Yes, student learning is a complex business and one could argue that all of the above needed to be done. However, there is one key area that we do not seem to know much about, and in which teachers and administrators have received almost no training. There is quite a lot of emerging research about the Noncognitive factors involved with student learning. This is to do with how a student *feels* in our classroom. It is about their beliefs, in themselves and in the value of the work they are doing. It is about their sense of belonging and identity. It is about their attitudes and their self-regulation. It is about how they think of themselves <u>as a student</u>; their *Academic Identity.*

Teachers have known for a long time that a student's 'sense of fit' is important in the learning process. Just as the real estate mantra is 'location, location, location', for many teachers the mantra of the classroom is 'relationships, relationships, relationships.' However we have been unable to unpack the detail behind this belief and to begin to understand the psychology involved.

To me, this line of thinking shows great promise, and I am hugely optimistic that we will be able to strengthen a hitherto neglected piece of the learning puzzle. This will involve challenging some of our thinking; the predominant societal view of the fixed nature of IQ is an example; the way in which most adults praise achievement is another. But there is nothing here that we cannot do, and in fact several interventions show striking and lasting results with very little involved in the way of time and resource. This is not magic, as Yeager and Walton (2011) note, but I do believe that this work begins to get to the essence of the problem of student disengagement, and points towards solutions. Fullan refers to this as 'the skinny', and notes that "the design work is hard but the use is engaging and even hard work seems easy." (Fullan, 2013, p. 17)

Defining the term 'noncognitive'.

The term 'noncognitive' can be misleading and difficult to define. Farrington et al (2012) define noncognitive factors to include strategies, attitudes and behaviours that are crucial to academic performance. It can include such things as perseverance, motivation, self-regulation and social skills. "In short, mental constructs that we think contribute to student success, but that don't contribute *directly* to the sorts of academic outcomes we measure." (Willingham, 2013, p. 1/21/2013)

It is not a great term for the following reasons: it has the tendency to be a catch-all, in that everything that is not *cognitive* is therefore *noncognitive;* there is a temptation to think of noncognitive factors in isolation whereas evidence suggests that cognitive and noncognitive factors interact; and there is also a tendency for noncognitive factors (some of which are the so called soft skills) to be seen as less weighty than cognitive ones.

In considering noncognitive factors in this report then, we will consider "the ways students interact with the educational context within which they are situated and the effects of these interactions on students' attitudes, motivation, and performance. (Farrington, et al., 2012, p. 2)

A Model of how Noncognitive Factors affect Academic Performance

Farrington et al (2012) organised the noncognitive factors into five categories.

For the first three categories, they reasoned as follows:

1. To get Academic Performance you need to exhibit **Academic Behaviours** (e.g. going to class, doing homework and assignments, organising materials and time, participating and studying).
2. To consistently display Academic Behaviours you need **Academic Perseverance** (e.g. grit, tenacity, delayed gratification, self-discipline and self-control).
3. To acquire Academic Perseverance you need to have positive **Academic Mindsets** (e.g. I belong in this academic community, my abilities grow with effort and are not fixed, I can succeed at this, this work has value for me).

Now consider this key concept. These three factors, together with the outcome of improved academic performance, form a recursive loop which is self-strengthening and self-perpetuating. With increased performance, comes increased self-belief. With increased self-belief comes increased perseverance in the face of difficulties. With increased perseverance comes improved academic behaviours. And with improved academic behaviours comes improved performance. Let's call this a positive recursive loop.

Unfortunately many of our low-performing students are caught up in the opposite of this; a negative recursive loop. I don't belong in this classroom, I'm dumb at this and always will be, I won't get this right no matter how hard I try, and anyway what is the point of all this. With each poor academic result, comes less self-belief, less perseverance, less academic behaviours and so on.

If I was sitting in a classroom thinking most or all of these things about myself, I wonder how I would behave? Actually, I'd really want to just walk out, but given that I have to be there, I am sure I would display behaviours typical of many low-performing students. I wouldn't do any work, I'd arrive late, I'd distract others, I'd tell jokes, and on a really bad day, I'd engineer a confrontation so I didn't have to put up with this environment any longer.

I mentioned five noncognitive categories, and so far, have itemised just three. The final two categories 'bolt onto' the side of this loop and assist it to function. They are:

4. **Learning Strategies** such as study skills, metacognitive strategies, self-regulated learning and goal-setting and time management strategies. These are necessary to make sure that our effort is directed and organised.
5. **Social Skills** which we need in order to communicate and interrelate with all of the people in this learning context, because we can't do it on our own. These are such things as interpersonal skills, empathy, cooperation, assertion and responsibility.

All of this sits within the school and classroom context, the student's own background characteristics and the wider community cultural and social context.

> **School and classroom context.** This includes classroom aspects such as the teacher relationship, the peer relationships, the level of expectation and challenge, the extent of student choice and autonomy, the structure of assessment and so on. Examples of schoolwide aspects include timetable structures, programme choice, the support and guidance systems, the level of safety, behaviour support, school culture and climate.

> **Student background.** These include demographic variables such as ethnicity, age, gender, language, socio-economic status as well as family and neighbourhood characteristics that might affect academic performance.

> **Socio-cultural context.** This includes the wider context such as employment opportunities, school resourcing, the presence of racism, sexism and other discrimination that give rise to stereotypes within society.

Figure 1 below summarises this hypothetical model. The authors point out that further research is necessary to determine the relative strength of each of the relationships, and that many of the arrows could be pointed on both ends, to indicate reciprocal links.

A Hypothesized Model of How Five Noncognitive Factors Affect Academic Performance within a Classroom/ School and Larger Socio-Cultural Context
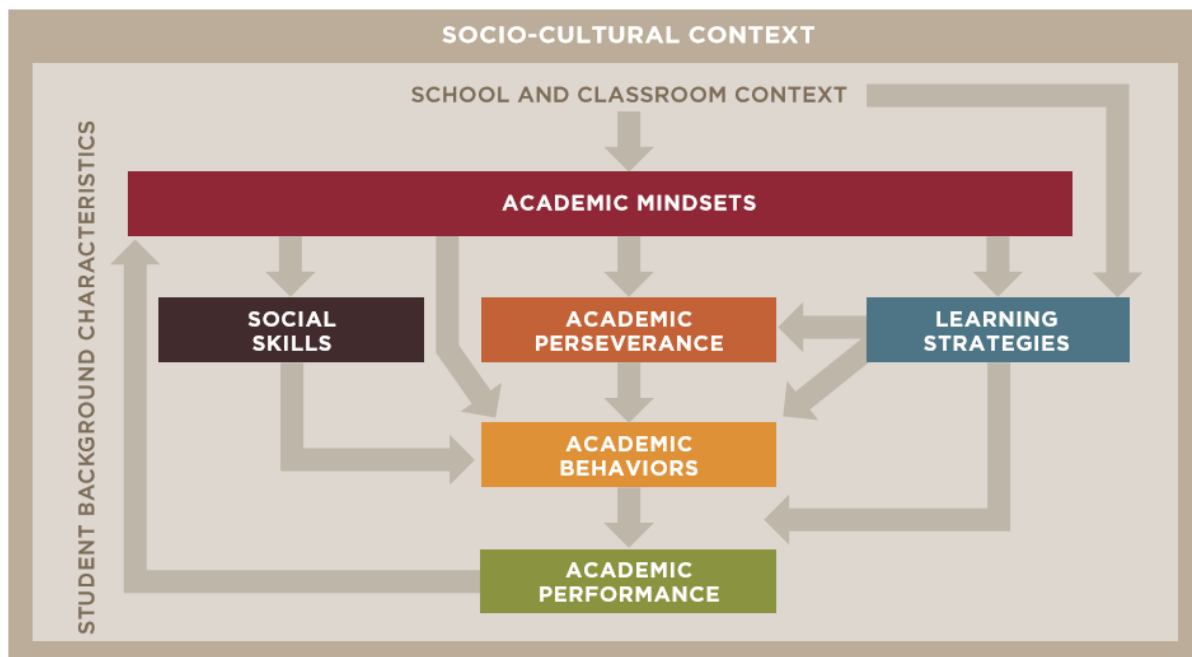

Figure 1. (Farrington, et al., 2012) Reprinted with the kind permission of the UChicagoCCSR

Start with Academic Mindsets and Learning Strategies
(This is where you can have the most influence)

In the absence of any training and exposure to the influence of noncognitive factors in learning, teachers often wrongly diagnose a student who exhibits poor academic behaviours. For example, they may be seen as lazy and lacking motivation, that they do not care, and that these are personal characteristics which they bring with them which are unlikely to change unless the student develops some perseverance and grit.

No-one deliberately puts themselves in the position of being lazy and useless and failing at everything. At the core of this, is a person who doesn't believe there is any hope for them to get better. Their mindsets are negative, and even if they did try, they lack the learning strategies to assist with that effort.

This is where we begin.

The central conclusion of the extensive report done by Farrington et al (2012), is that the real 'bang for your buck' comes in the area of **Academic Mindsets** and **Learning Strategies.** This is where the real leverage is.

Four Academic Mindsets

Four academic mindsets are presented. Thinking of yourself as the student, they are:

1. I belong in this academic community
2. My ability and competence grow with my effort (Growth Mindset)
3. I can succeed at this (a given task); and
4. This work has value to me.

When these four mindsets are in play, students are much more likely to persist despite difficulties.

It is easy to see how a low-performing student might be quite negative about each of these mindsets, and it is true that interventions have shown greatest improvements with those achieving the lowest results (Paunesku, et al., 2015). My own experience suggests that even good students can suffer from self-doubt from time to time. This especially occurs at transition points when students shift schools and are settling into the new environment.

Malleability. Can we make a difference?

Is it even possible to intervene and change a student's beliefs and attitudes about their academic identity? The answer to this question is a resounding YES.

The good news is that there is very real recent evidence that we can have quite a bit of influence. Yeager and Walton (2011) have summarised and analysed nine interventions that have been shown to improve academic performance, and the results have been startling.

These nine studies specifically target three of the above mindsets: Sense of Belonging (5); Growth Mindset (2); The work has value to me (1); and both Belonging and Growth Mindset (1).

The interventions are all brief. They range from one 15-20 minute session (the shortest) to a series of 10 workshops (the longest). Remarkably, in several studies, the improved results are seen to be present two and even three years later. They have the following features in common:

1. **They target the student's subjective experience in school.** It is not the teacher's view which counts here. It is how the student feels and what their beliefs are. It is tempting to believe that our classrooms deliver the same experience to every student; they do not. (Yeager, Walton, & Cohen, 2013). What each student experiences, is individual to them. It is the individual student's perspective which counts. The subjective situation matters. (Cohen & Garcia, 2014)
2. **They are specific, yet stealthy.** These approaches are indirect but well targeted. There is no direct teaching or appeal to the student. Students are unaware of the real reason for the task they are asked to do.
3. **They interact with recursive processes already in schools.** This is why they can have such long-lasting effects. The intervention itself fades from the student memory, just as you might expect for any one-off experience. But these interventions, become part of a positive recursive loop. They affect one's attitudes and beliefs.

This is not magic. Initiatives need to be well-timed and well-targeted. The psychological processes need to be understood, and the fidelity of the approach needs to be preserved in the delivery.

Growth Mindset

One of our four mindsets (above) is the Growth Mindset. This is the belief that one's ability and competence can grow with effort. This is also one of the key ideas that kept resurfacing in my thinking and which I wanted to have further time to consider.

A good starting point here is Carol Dweck's (2006) book: *Mindset. How you can fulfil your potential.*

The Growth Mindset then, is the opposite of a 'fixed mindset'.

When applied to the idea of intelligence, a fixed mindset view is that intelligence is fixed and 'assigned at birth'. In contrast, the growth mindset view is that intelligence can be developed. Holding a fixed mindset can seriously affect a person's openness to learning, their motivation to persevere, and their investment in effort. How people attribute the cause of their success or failure influences how much effort they apply in the future (Rose, 2014).

Here's how:

Mindset Rule #1:

- **Fixed Mindset: Look smart at all costs.**

  Students with this mindset want to be the star. They are focused on how they look instead of learning.

- **Growth Mindset: Learn at all costs.**

  Everything is a learning opportunity. Mistakes are normal and help us to learn.

Mindset Rule #2:

- **Fixed Mindset: It should come naturally.**

    Students with this mindset think it should all come easily. If they have to make an effort, they feel this somehow reflects badly on their 'intelligence'.

- **Growth Mindset: Work hard. Effort is key.**

    Research shows that it takes 10,000 hours to master a skill. Students with a Growth Mindset understand that learning is a process and they accept that it is, at times, a struggle. They embrace challenges and learn from criticism.

Mindset Rule #3: In the face of setbacks …

- **Fixed Mindset: It's all about me**

    Fixed Mindset students try to hide their mistakes and conceal their deficiencies. They often blame others when something goes wrong, and are more likely to cheat. In one study, almost 40% of the ability-praised students *lied* about their scores. (Mueller & Dweck, 1998)

- **Growth Mindset: It's about learning**

    These students capitalise on mistakes and confront their difficulties. Sure, they will be disappointed when they get a poor result, but they do not see this as the end point. The focus is on improvement, so they will figure out what went wrong and try harder next time (Dweck, 2013).

Intelligence Quotient (I.Q.)

Let's face it. As a society we have a hang up with I.Q. We see it as a judgement on one's intellect. As in: this is what you were born with, this is what you've got now and this is the best you'll have until you quietly deteriorate in old age. We have a similar belief about our ability to learn Maths. There is a widely held view that you either have a Maths brain, or you don't. (In a survey of developmental math students at 21 colleges throughout the United States conducted by the Carnegie Foundation for the Advancement of Teaching, nearly 70% of students endorsed a fixed mindset about maths ability, saying a person is just a "maths person" or not, and there is nothing they can do about it.)

This is patently incorrect.

The Frenchman, Alfred Binet, designed the I.Q. test and he did it to try and help identify children who were underperforming in the Paris Public School system, so that new educational programs could be designed to get them back on track. Binet believed that we could grow our intelligence.

> "A few modern philosophers … assert that an individual's intelligence is a fixed quantity, a quantity which cannot be increased. We must protest and react against this brutal pessimism … With practice, training, and above all, method, we manage to increase our attention, our memory, our judgment and literally to become more intelligent that we were before." Cited in (Dweck, 2006, p. 5)

The notion that one's I.Q. is fixed at birth, forms part of the wider Nature vs Nurture debate. Certainly one's genetics are important and cannot be ignored. We are not all born the same. The

whole point of genetic evolution is diversity. So we do not all start with the same academic talents, musical talents, sporting talents etc. But neither should we believe that each of these things is fixed. Nowadays, the predominant view is that it is Nurture *and* Nature that are contributing influences and there are countless examples of people starting out with very little apparent natural talent, who end up experts in any given field.

The development of the I.Q. scale was not to support a fixed mindset. It was designed to be a snapshot. Binet himself intended it's use to be in the support of showing growth in intelligence.

Unfortunately, many in our society worship the idea of 'natural talent' and/or 'intelligence'. We think that if young Jonathan is 'a natural' or if he is 'bright', then he will be successful. "In fact, however, more than 30 years' scientific investigation suggests that an overemphasis on intellect or talent leaves people vulnerable to failure, fearful of challenges and unwilling to remedy their shortcomings." (Dweck, 2007, p. 36)

To Praise or Not to Praise

The way adults praise can have a large effect on a child's mindset. This praise is nearly always well-intentioned.

The type of praise I am talking about here, is Person Praise. Person Praise is often delivered by the child's own parents. Family friends, relations and teachers are prone to delivering Person Praise as well.

It goes like this:

- Two year old Jonathan is being read to by his Grandmother. Out of the blue, he points to a picture in the book and says "Giraffe." Jonathan has never identified a Giraffe like this before, so Grandma responds with praise, "Well done Jonathon. Oh you are such a clever little boy, aren't you!" This is Person Praise and it is harmful because it reinforces a fixed mindset; some people are clever and others are not.
- Nine year old Amelia comes home from school with a very good report. She is top in the class. A proud Mum delivers the praise, "Good on you Amelia, top of the class again. You're such a smart kid." Again this is Person Praise and again it reinforces a fixed mindset. What happens when Amelia is not top of the class? Is she no longer smart?

Person Praise treats success as if it is a personality trait. It does not recognise perseverance, or effort, or attitude. What we should be doing is delivering Process Praise (Strategies and Effort).

- Jonathan's Grandma could have said, "Well done Jonathan. I didn't know you could recognise a Giraffe like that. You must have been practising when I'm not around!"
- Amelia's mother could have said, "Good on you Amelia. You've worked really hard this term, and I particularly like the progress you have made in Maths. I've seen you spending extra time on that."

Process Praise recognises an action that the child has taken, and it acknowledges them for being in charge of that action. Process Praise encourages a Growth Mindset.

Unfortunately, Person Praise is all around us. If you are observant, you will frequently hear examples of it. It is such a common, everyday practice.

Why is this? Well, one reason might be because we don't understand the effect that it could have. In fact, quite the opposite. To praise a child for their intelligence is seen by many as being an important way to support a child's self-belief *so that they will succeed*. In one study, 85% of parents believed that praising children's ability (i.e. their intelligence) when they perform well on a task is necessary to make them feel that they are smart. This 'lay' theory of Praise needs to be debunked. Back in 1998, six studies demonstrated that praise for intelligence had more negative consequences for students' achievement motivation than praise for effort. (Mueller & Dweck, 1998) Carol Dweck has studied hundreds of children and some of the clearest findings she has ever seen show that: "Praising children's intelligence harms their motivation and it harms their performance." (Dweck, 2006, p. 175)

A second reason could be that it is just easier to do. Person Praise uses Daniel Kahneman's System 1 brain. You don't have to think about it. A bland comment like "You're so smart" takes no effort at all. Whereas, to identify the actions we want to reward with Process Praise, takes quite some effort on our part. It requires the use of Kahneman's System 2 brain, which we have to quite consciously access. (Kahneman, 2011)

Ironically, when we have to deliver a disciplinary message to a child, we quite readily separate the action from the person, and are at pains to point out they are not 'a bad person'; it's just that the thing that they did was a 'bad thing to do'.

In summary then, we need to be careful how we deliver praise. Avoiding Person Praise is a sensible strategy. (Rose, 2014)

Redefining Failure

We have a very negative and unhelpful view of the word FAIL. In chatting about this project, Assoc. Prof. Ross Notman said something which stuck in my mind. "FAIL," he said, "I like to think of it as First Attempt In Learning."

In her 2016 TEDx talk at Stanford, Jo Boaler addresses how peoples' beliefs about their 'maths brain' can affect their learning. She used brain imaging techniques to make her point. When someone with a Growth Mindset makes a mistake, their brain lights up with activity. In contrast, when a Fixed Mindset person makes a mistake, very little activity is registered. (Boaler, How you can be good at math, and other surprising facts about learning. TEDx Stanford, 2016)

If we have the right belief system (mindset), then the brain science actually shows that the brain grows. The mistakes are a way of helping us to learn and to open up other neural pathways, and new synapses are formed in the brain. Wise people have known this for a long time, but now we have the brain science to back it up.

> "If you're not making mistakes then you're not doing anything.
>
> I'm positive that a doer makes mistakes"
>
> *John Wooden, legendary USA basketball coach.*

So, if students are producing pages of correct work, then the brain is not growing, and opportunities for development are being missed (Boaler, 2013). Every time we find something we can't do, then we have the opportunity to learn.

If we want to support a Growth Mindset, we need to think absolutely positively about mistakes, and we need to reframe the word failure, to include that powerful three lettered word 'YET'.

I haven't finished this, yet.

I don't understand complex equations, yet.

I can't remember my French vocabulary, yet.

John Wooden knew this too. He used to say that you aren't failing until you start to blame. When you start blaming something, or someone else for your mistakes, then you have stopped taking responsibility and you have stopped being open to learning. 'Blame' is a good indicator of a fixed mindset.

Putting IQ and similar notions of superiority in their right place, redesigning how we deliver praise, turning 'mistakes' into a positive and welcomed experience and treating 'failure' with it's antidote – the powerful 'not yet' – are all ways of promoting a Growth Mindset.

I Belong in this Academic Community

Belonging is a very strong and fundamental human need. Mazlow noted this a long time ago in his hierarchy of human needs. In our school setting, this relates to a student's feelings of connectedness to their peers, to the adults in their classes and their school (Farrington, 2013).

I am sure we have all experienced what it feels like to 'be in the wrong place'; in a room full of strangers say, and you're not even sure why you are there. Most people's first reaction is to want to leave!

Students can feel that they don't belong for a variety of reasons: they might be new to the school, having arrived part way through the year; they might be younger than the other students; they might feel they have few friends in the class; they might be suffering from a negative stereotype threat associated with their race or their gender or their sexuality.

Most of the research I have read is based in the United States. When they discuss negative stereotype threats the topics are mostly: African Americans compared to White Americans, and Girls in Maths and Engineering compared to boys in those subjects.

As I read about the African American/White American stereotypes, my mind often finds similarities with NZ Maori compared to NZ Pakeha. I have no research evidence for this. Having been part of the He Kakano project for three years, I do have an appreciation of how important 'Identity' is for young Maori in our classrooms. The work of Russel Bishop, Mere Berryman and others emphasises "Maori learning as Maori." An aspect of this is bringing Maori values into the classroom and strengthening the 'belonging' of these students. So now we are touching on the all important *context* associated with these matters, in this case, a New Zealand context.

Many of the interventions in Social Belonging address the achievement gap between African Americans and White Americans. Very subtle and seemingly trivial interventions have been shown to have quite striking and lasting effects.

For example:

1. A brief intervention was aimed at bolstering African Americans' relative uncertainty about college. A feeling that they did not belong, because they were somehow not good enough.
2. Students in the target group were asked to read a report ostensibly detailing the results of a survey of more senior students.
3. The survey 'normalised' the difficulties associated with fitting into academic life. The senior students reported such things as: having difficulty making new friends; feeling homesick; struggling to keep up with the work.
4. The concerns were presented as common, temporary and due to the challenging nature of the transition to college.
5. The target participants then wrote an essay describing how their own experiences echoed those in the survey.
6. Finally, they were asked to turn this essay into a speech, which they videoed. They were told that the videos would be used to help future students cope with the transition.
7. A control group carried out similar tasks, but the fictional survey addressed issues unrelated to belonging.
8. The whole intervention lasted about 1 hour.

The results showed that:

1. African American students in the control group showed no improvement in GPA (Grade Point Average) over time.
2. African American students in the target group showed continually improving GPA results over time i.e. an upward trajectory.
3. By the students' senior year, the achievement gap between the targeted African American students and their White American counterparts had closed by 79%.
4. The intervention tripled the percentage of African Americans earning postintervention GPAs in the top 25% of their class, and reduced the percentage of African Americans performing in the bottom 25% of their class.
5. Further, 3 years after the intervention, the targeted African American students reported being healthier and visiting the doctor less than African Americans in the controlled condition (28% seen Doctor recently compared with 60% seen Doctor recently).
6. Participants were unaware of the effect of the intervention.

(Walton & Cohen, 2011)

I have read about thirteen or so such interventions. They do not all target Social Belonging, but they do all target well defined psychological factors at play in the classroom, and they do it in subtle ways. My purpose in discussing one piece of research in such detail, is to provide the reader with some sense of the importance of these discoveries. A one-hour intervention activates a positive recursive loop which continues to raise achievement three years later!

How can we influence students' mind-sets?

Yeager et al (2013)suggest that there are at least two ways to influence students' mind-sets in the educational setting:

1. **Everyday Interactions** with students: the way parents and teachers praise; the way we frame critical feedback; the subtle cues we give about race and gender (for example)
2. **Precise, Theory-based Interventions.** These redirect a student's thinking towards a Growth Mindset, or a belief in belonging, or the value of the learning.

(Yeager, Paunesku, Walton, & Dweck, 2013)

Everyday Interactions

This is what we weave into the culture of our school and of our classrooms. There are opportunities in assemblies, newsletters, parent meetings, staff professional development sessions and so on, to continue this work, that I believe we have already begun at Gore High School.

For example, the recent academic counselling system fits perfectly in this regard. I see huge opportunities here to enhance a student's sense of belonging. (Their family's connectedness to the school also.) I see this as an opportunity to model Process Praise and to model the power of 'not yet'. Further possibilities exist to discuss the values that are important to a particular student and to explore how the learning at school can strengthen the student's ability to contribute to the greater good of the community that is important to them. This provides a sense of purpose. Conversations between parents, students and teachers can help clarify a student's core beliefs about school.

Mastery Goals vs Performance Goals

A special mention here about Mastery Goals and Performance Goals. It has taken me some time to get my head around these terms and to appreciate the underlying importance to our topic. I like the following distinction:

> **Mastery Goals –** the goal is to develop competence
>
> **Performance Goals** – the goal is to demonstrate one's ability

Research consistently and clearly indicates that the adoption of mastery goals is related to beneficial educational outcomes. (Lucariello, et al., 2016). The American Psychological Association have published a list of the top 20 principles from psychology for teaching and learning.

> **Principle 10 is**: Students persist in the face of challenging tasks and process information more deeply when they adopt mastery goals rather than performance goals. (Lucariello, et al., 2015)

This is a wonderful document and I would recommend that all teachers at least have a look at it, along with the previously cited Lucariello et al (2016) document which explains the research behind these principles.

So it is important then, in our academic counselling, to guide students towards setting Mastery Goals.

Teachers have mindsets too

Of course, much of this work goes on in each classroom and it is here that the classroom teacher plays such a vital role.

We first need to acknowledge that teachers have mindsets too. Some will have a fixed mindset and some will have a growth mindset, and some will switch between both. We are all a product of our upbringing and our experiences so far in life, and many of us came through an education system which very definitely encouraged fixed mindset thinking. If you were an A stream student you took French, if you were B stream, you took Technical Drawing!

I like to think that I have a growth mindset. I have leaned towards this belief for some time; well before I had even heard of the term. For as long as I can remember, I have always thought that with effort, you can improve yourself. This is what attracted me to teaching in the first place, and I suspect that the majority of teachers favour this disposition.

I found some challenging reading in Carol Dweck's book, (Dweck, 2006) and realised that when it comes down to the finer detail, I have some unhelpful fixed mindset notions as well.

So a good place for teachers to start, is to examine their own beliefs and to be prepared to keep them under review.

An understanding of the latest brain science research is very helpful. This very much affirms the growth mindset and the plasticity of the brain to adapt and grow, "some of the evidence coming from people who have suffered major brain lesions, who have gone on to learn reading, writing, bike riding and other abilities that required the brain to grow in response to effort (Bunge et al, 2007; Beilock, 2011)" cited in (Boaler, 2013, p. 144)

Jo Boaler has worked extensively with teachers, mainly in the field of Mathematics. This is the subject that communicates the strongest fixed mindset messages. She believes that even a simple awareness that ability is malleable has profound implications for teaching (Boaler, 2013).

Carol Dweck reports on the work of a German researcher, Falko Rheinberg who who studied teachers with different mindsets. Those with fixed mindsets made statements like:

> "According to my experience, students' achievement mostly remains constant in the course of a year."

> "If I know students' intelligence, I can predict their school career quite well."

> "As a teacher, I have no influence on students' intellectual ability."

(Dweck, 2013, p. 66)

This is what happened to the students in their classes.Those who started the year in the high-ability group ended the year there, and those who started the year in the low-ability group ended the year there.

In contrast, students taught by growth mindset teachers displayed a different result. In these classes, it didn't matter whether students started the year in the high- or low- ability group. Both groups ended the year achieving at the high-ability level (Dweck, 2006).

This really just affirms something we already know: teacher expectations are critical to student achievement.

It behoves teachers then, not to make quick judgements. This is a sign of a fixed mindset. It is so easy to do. Whilst having a coffee in the staffroom, you overhear talk of a particular student, and before you know it, your academic expectations have been lowered.

Another trap is to assume that students bring their bad attitudes from home.

Evidence suggests that a student's beliefs and expectations are the product of the experiences they have had in schools and in classrooms so far (Farrington, et al., 2012). They are not character traits. As such, they are malleable and they can be changed.

The context of the individual classroom is critical in terms of the Everyday Interaction strategy. Remember the Four Mindsets (above). Three of them include the word *this*: I belong in *this* academic community; I can succeed at *this* (task); *This* work has value for me.

Precise, Theory-based Interventions

There is an increasing body of evidence which shows that well-timed and well-targeted interventions can trigger very significant improvements in student achievement, particularly for those students who already have low expectations of themselves. Even a well-entrenched mindset can be altered, and this is at the very heart of the idea of malleability. This is possible in adolescence and even later in adulthood (Yeager, Paunesku, Walton, & Dweck, 2013).

The interventions are precise and target different pyschological constructs. For example:

Growth Mindsets

7th graders (12 year olds) in New York City learned to think of their brains as muscles that got stronger as you exercised them. They visualised neural connections as they attempted difficult maths problems. The target group performed significantly better at the end of the semester, a trend which was still present two years later. The control group showed continued decline in Maths performance. The study was carried out over four successive years and involved 373 students (Blackwell, Trzesniewsk, & Dweck, 2007).

Paunesku and colleagues have used a single 45 minute web-based intervention. The task involved reading an article focused on the implications of brain research findings for students' potential to become more intelligent through study and practice. Students then summarised the findings in their own words. Then they were asked to write about what advice they would give a new student who was worried about not being 'smart enough'. The trial involved 1594 students in 13 geographically diverse high schools. The most significant improvements are seen in the students who are already underperforming (Paunesku, et al., 2015).

Social Belonging

(See the study detailed above targeting African American students as they made the transition to College.)

Walton has authored a brief paper with detailed practical advice about how to deal with the Social Belonging issue (Walton, 2014).

Stereotype Threat

This is obviously related to Social Belonging and Identity, so we can refer to many of the same interventions here. Worldwide, there are many examples of large differences in academic achievement between ethnic minority groups, so this is not just a difficulty we face in New Zealand. Though the situation is complex, there is little doubt that psychological processes play an important role. For example, worry that a student might be seen through the lens of a negative intellectual stereotype can undermine performance (Yeager & Walton, 2011).

Cohen and Garcia (2008) tested whether value-affirmation could assist in breaking down stereotype threat. They delivered an intervention to white and black 7th grade students. In a writing exercise, half of the students identified two or three values that were personally important to them and wrote about why they mattered. Control students identified values that were not important to them, and wrote about why they might be important to someone else. The exercise took 15-20 minutes and was timed at the start of the year. Academic progress was monitored for the next two years, and results showed that the achievement gap between black and white students was reduced by 40%.

Value and Sense of Purpose

Chris Hulleman and Judith Harackiewicz developed an intervention to encourage high school students to see the relevance of Science in their lives. Every three to four weeks, the target students wrote a brief essay describing how what they had been studying in science could be applied to their lives. The control group simply summarized the week's topic. By the end of the academic term the targeted students who originally had low success expectancies in Science showed a striking increase in their grades. Interestingly, these gains only occurred when the students themselves came up with the reasons why the schoolwork was relevant (Hulleman & Harackiewicz, 2009).

Intervention Design

Use of the Internet

There has been some promising work in delivering self-administered interventions over the internet. (See www.perts.net and www.mindsetworks.com) Students can do these in a supervised situation at school or in their own time at home (Yeager, et al., 2016).

An advantage of using the internet, is that the fidelity of the intervention is maintained. Otherwise, there is a risk that subtle changes in wording or subtle cues at the time of delivery can have an effect. In one study (not to do with education), researchers affected voter turnout by changing one word from a noun to a verb. ("How important is it to you to be a voter in tomorrow's election?" became "How important is it to you to vote in tomorrow's election?") This subtle change led to one of the largest increases in turnout ever observed in a randomized experiment, an increase of 11% for the noun condition compared to the verb condition (Walton, 2014).

A disadvantage is that the intervention is not tailored to a specific context. This may suit some psychological constructs however e.g. Growth Mindsets, which may be more universal at their core. We need to keep in mind here that interventions will only work if they are delivered in ways which change how the students think and feel in school. Thus, the school context is critically important (Yeager, Walton, & Cohen, 2013).

Wise Interventions

Psychology is subtle and the interventions need to keep in mind the lessons and techniques that psychologists understand and know. Thus, there is a risk that 'meddling' without understanding will be counter-productive. The message is: Psychology Matters. (Cohen & Garcia, 2014)

Timing is important. Interventions are most effective right at the beginning, or near the point where it causes people to feel threatened, either just before or just after. The benefits do not depend on dosage, but timing. (Cohen & Garcia, 2014). This leads me to think that about two points for Gore High School: firstly at the beginning of Y9 as students make the transition to High School; and secondly at the beginning of Y11 as students enter the NCEA assessment process.

Stealth is also important. An example of stealth is the 'saying is believing' technique. This is where the target students repeat the message in their own words in the form of giving advice to future students. Another example of stealth is that most often, students are unaware that they have been identified as needing in an intervention in some way. If they had been identified, it might cause them to feel stigmatized, and a 'you need help' message might be worse than no intervention at all. So the psychological techniques 'under the hood' of these interventions are important. (Cohen & Garcia, 2014)

Wise interventions :

- Are psychologically precise
- Target recursive processes to cause lasting change
- Are context dependent

To take account of the context, interventions must be wise to the population at hand in at least three ways. Firstly, they must target matters in the setting at hand. If students already believe in a Growth Mindset, then there is little point in targeting that. Secondly, they may need to be adapted to illustrate the message in the local setting. Thirdly, they must be timed to capture the correct moment in the recursive process (example of where this might work at Gore High School already given, Y9 & Y11).

Implications for School Practice at Gore High School

As I write this report I am conscious of any practical considerations which might be implemented at Gore High School. Here are some suggestions:

1. **General Understanding**
   a. Through PD opportunities assist staff to:
      i. Develop their understanding of the four mindsets
      ii. Examine their own Growth/Fixed mindsets
      iii. Get better at recognizing Growth Mindsets and Fixed Mindsets in their students
      iv. Become aware of the evidence supporting 'malleability'.

<ol type="v" start="5">
Be able to identify Mastery Goals and Performance Goals
Become aware of how they deliver Praise and the evidence supporting Process Praise.

b. Assist members of the Board of Trustees in a similar but less detailed way.

2. **Everyday Interactions**

Build on the strong relationships and healthy attitudes about learning already evident at Gore High School by:

a. Using Academic Counselling to spread our influence with parents and students with regard to:
<ol type="i">
The belief in a Growth Mindset
The development of Mastery Goals
The use of YET to redefine failure
The delivery of Praise

b. Using school assemblies to reinforce these messages

c. Publishing suitable articles in the school newsletter to promote awareness of the relevant research evidence.

3. **Precise, Theory-based Interventions**

Senior Staff at Gore High School to:

a. Investigate the practicalities of implementing interventions at Gore High School. I suggest doing this in the following order:
<ol type="i">
Growth Mindset
Social Belonging
Stereotype Threat

b. Investigate the possible timing of such interventions

c. Identify target students who would likely benefit from a stealthy intervention

d. Bring forward a recommendation for consideration by the BoT and Staff

Summary

When dealing with the noncognitive factors in our classrooms, it is how the *student* feels that matters. We should not be surprised that students experience the same classroom in diverse ways: "Understanding what school feels like for different students can lead to nonobvious but powerful interventions". (Yeager, Walton, & Cohen, 2013, p. 62)

Psychological Interventions offer great promise. They are often brief (by design) and when they tap into recursive improvement loops, they can have a significant and long-lasting effect on student achievement. This is particularly so with low-achieving students.

Academic Mindsets matter. In following through from Figure 1 (Farrington et al. 2012) presented earlier, I have focused on this element almost entirely. There are two reasons for this. Firstly, although Farrington et al. identified that all five categories worked *through* academic behaviours, they also identified that the points of most influence were Academic Mindsets and Learning Strategies. Secondly, I felt that teachers are well versed in Learning Strategies but probably quite unaware of the complexities and importance of Academic Mindsets.

Yeager et al. (2013) point out that there are two possible ways for schools to deliver: through Everyday Interactions and through Precise Theory-based Interventions. Much of this report is about giving more detail in these two areas, so that we can better understand how to begin to plan noncognitive factors into our teaching and learning. In our everyday interactions we can adopt Growth Mindset attitudes, we can strive to deliver Process Praise and eliminate Person Praise, we can model the power of 'not yet!' And we can do this in a way that presents ideas to students without requiring them to adopt them. For instance, it is better not to label a person as having say, a Fixed Mindset. It is important for the individual to freely adopt their own beliefs and values.

Researchers have identified a few key psychological constructs where Targeted Psychological Interventions can assist. The specific design of these needs to be well understood before targeting and implementation, and the local context needs to be taken into account. In many ways, this makes using this method all the more challenging.

Acknowledgements

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