Alliance of
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Contents

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OUR ANNUAL MAGAZINE IS ALL ABOUT GIRLS' SCHOOLS AND GIRLS' EDUCATION. OF COURSE IT IS. BUT IT'S ALSO A SNAP–SHOT OF THE EDUCATION LANDSCAPE, A COLLECTION OF ARTICLES SHOWCASING INNOVATION, RESEARCH, AND TRULY GREAT PRACTICE FROM OUR MEMBERS AND CONTRIBUTORS.

LOREN BRIDGE, EXECUTIVE OFFICER

And this year it's a particularly interesting collection. Samantha Lau, a 2018 graduate of The Mac.Robertson Girls' High School in Melbourne and now an undergrad at New York University Abu Dhabi, credits her girls' school education with developing her self-confidence, big ideas and wild ambitions (page 6). As Sam confided in an email, "It really is no lie, though, when I say I reflect on Mac.Rob's lessons constantly wherever I go".

Supporting Sam's experience at an all-girls school, a study released in December 2018 by the Australian Gender Equality Council found that girls educated in single-sex schools are equally as self-confident as boys educated at single-sex schools. The Hands up for Gender Equality report revealed that self-confidence in students from Queensland's single-sex schools was "gender neutral". The research, led by Dr Terrance Fitzsimmons of The University of Queensland, was based on a survey of over 10,000 students in Years 7 to 11 from Queensland's girls' and boys' schools. It demonstrated that for girls in single-sex schools, there was absolutely no gender difference in self-confidence — an attribute that is considered vitally important for work and life success, and perhaps particularly for work-entry success.

Fitzsimmons goes on to suggest that women's lack of confidence in the workplace is not innate; it is instead eroded by external factors such as sexism and gender stereotyping. He posits that more emphasis should be placed on "organisations examining themselves first, rather than starting from the position of trying to fix women". Fitzsimmons is hoping to replicate his study across more Australian states in 2020.

Backing this view, a 2016 study from Bristol University found that girls in co-educational schools have lower self-esteem and feel more pressure to be thin than girls in single-sex schools. The study concluded that single-sex schools encourage "improved self-esteem, psychological and social wellbeing in adolescent girls".

There are numerous research studies that show unequivocally that students in single-sex schools benefit academically from a learning environment free from gender stereotyping, unconscious bias and social pressure. Our 2019 research grant recipients, Dr Rebecca English and Professor Raechel Johns, hope to add further support to the case for single-sex schooling. They are studying the life outcomes of graduates of all-girls schools in Australia and New Zealand. Specifically, they are looking at how the experience of attending a girls' school has influenced the thousands of women who have passed through their doors and, in the process, debunking the myth that the socio-economic status of all-girls school alumnae is the key factor in their career and life success. In a personally insightful article, Rebecca explains how she and Raechel became fascinated with single-sex education and how it has influenced their academic careers (page 13). Their study is due to be released in 2020 and I, for one, can't wait to read their findings.

This edition of In Alliance is a real celebration of girls' schools and their unparalleled opportunities for girls — we hope you enjoy it. ▲

Self-confidence, big dreams and wild ambition

SAMANTHA LAU, ALUMNA, THE MAC.ROBERTSON GIRLS' HIGH SCHOOL, AND UNDERGRADUATE, NEW YORK UNIVERSITY ABU DHABI

In May 2019, along with three of my Year 12 peers, I had the privilege of presenting at the Alliance's 'Fearless Girls, Strong Women' conference. We were invited to speak on the power of student voice as members of the Student Representative Council (SRC) of our school, The Mac. Robertson Girls' High School — or Mac.Rob, as it is more fondly known — Melbourne's only academically selective, public secondary school for girls.

I have since graduated from Mac.Rob, but I still find myself reflecting on the contents of our presentation, particularly the intangible and life-long lessons that can only be learned at a girls' school, and the skills and values cultivated in a girls-only learning environment.

I want to first draw attention to one of my favourite sections of our presentation, which tells the story of student voice at Mac.Rob:

> In 2015, the SRC president presented her vision about student voice to the school review panel — a board of teachers. It was that moment which sparked a change in our school, as she challenged the status quo, placing importance on student voice and its vitality in creating a culture of listening and open communication. As a result, seeing the power and passion of one individual led to a shift in teachers' mindsets, and quickly drew support from the student body. A teacher who attended this presentation recently reflected on this, saying 'That speech was one of the most emotional moments of my ten years at Mac.Rob. There was a small group of teacher and student observers who had tears in their eyes because they appreciated how difficult it was for her to challenge the status quo in her pursuit of student voice in the decision-making processes of the school.'

Prior to 2015, the importance of student voice had not been widely acknowledged; the responsibilities of the SRC extended to organising events and initiatives but fell short of contributing to legitimate decision-making within the school in a formal capacity. It was the president's vision that sent ripples of change throughout the school and gave rise to the SRC I led with my peers last year. The SRC has collaborated with staff to enact uniform reform, curriculum review and updates, peer mentoring programs, the introduction of annual synchronous and asynchronous e-learning days, and even compiled and published a professional learning text for staff, among many other commendable initiatives.

The 2015 SRC president, who basically coordinated this unleashing of potential for positive change within a whole community, is just the kind of individual you might find emerging from a girls' school: ambitious, self-assured, mould breaking.

It is this attitude and approach to life that I feel is perhaps the greatest take-away from my single-sex education.

In making this claim, I am reminded of a time before I moved to Mac.Rob, when I attended a co-educational school. I was sitting in a maths class, and we had just received our results from a recent test. One of the boys in my class who excelled in the subject had scored well, and he quickly came over to compare his marks to mine. As he was on his way over, I recall distinctly thinking to myself, "He's probably beaten me, but it's okay. All the boys are good at maths; as long as I'm top of the girls, that's good enough."

I now realise how this thought is problematic on so many levels. Not only had I succumbed to social conditioning, assuming that all the girls had performed worse than all the boys — because maths is apparently a 'boy subject'. I had also curbed my own academic ambitions by settling for being the best of my gender (whose ability I'd already unfairly judged), instead of the best in the class. It was as if my usual competitive spirit had been overridden by gender expectations I'd learned, and had never challenged at my co-educational school … sound about right?

Luckily, the following year, I moved to Mac.Rob, a place where gender stereotyping does not exist and wanting to be the best means being the best regardless of gender. Maths and science are not considered 'boy subjects' and girls overflow from higher level maths and science classes, girls play sport without being told by boys that they're 'really good for a girl' (girls actually lead sport portfolios, thank you very much); girls do anything and everything they want to. The best part? It's all normal.

Yes, there exists the overt messaging that we are girls and we are just as capable and competent as boys, and frankly I think this messaging is necessary to counter the equally overt sexism, to which we are shockingly still subjected today. However, what I believe is most empowering is the type of messaging that is implicit in the culture of girls' schools: the underlying assumption that girls are capable and competent, and what of it? The fact that girls are studying all kinds of subjects and participating in all kinds of extracurricular activities isn't made into a big deal; it's normalised. It's not that spectacular achievements aren't acknowledged and celebrated heartily — they are.

They're just not associated with gender, and that makes all the difference.

At girls' schools, it is as if gender expectations and the limits of society are suspended, creating an environment without glass ceilings. It is in this environment that I think I, and so many of my female peers, have been able to develop a unique sense of self-confidence, complementary to our big dreams and wild ambitions.

I look particularly to the next phase of my life and I can see this profound legacy with clarity.

In August, I hopped on a 14-hour plane ride to the United Arab Emirates, marking the official commencement of my four-year journey studying a liberal arts degree at New York University Abu Dhabi (NYUAD) (it is a bit of a mouthful, I know).

Around the middle of Year 12, I had just begun to entertain the idea of studying overseas. For years, my answer to the age-old question "What do you want to be when you grow up?" had been a polite but firm "No idea! I'll figure it out later". Finally, I'd reached Year 12 and realised that, with university choices looming, I had better start thinking, unless I wanted to end up in a degree I hated at worst, and felt apathetic about at best. I conducted a great deal of research on university courses in Melbourne and even interstate but dismissed each one as not being broad or flexible enough to encompass my wide range of interests. I attended open days but felt a distinct lack of interest in any particular campus, despite the perfectly respectable facilities each offered. Exasperated, I contemplated taking a gap year, but quickly abandoned the thought after my parents expressed concerns with which I agreed. Finally, I turned to the idea of studying abroad. If I had been willing to cross borders for a gap year, why not for my higher education?

However, I soon came to realise that studying overseas is somewhat of a foreign concept (pun intended) for many Australians; it is a niche and highly competitive pathway, and the arduous application process is therefore seen by many as not worth undertaking. Coupled with my choice to study specifically in the Middle East, about which people seem to have many misconceptions, I didn't have a plethora of endorsement from those around me.

This didn't faze me. From the minute I discovered NYUAD, I felt this was the path for me. I had such a strong emotional response to every bit of information I read, nodding along and feeling as if the university had written it just for me. I desired an education with a broad curriculum, one that valued problem-solving and critical thinking; I wanted an immersive university experience filled with travel and exploration, with diversity of both students and opportunities. I wanted a university which acknowledged the global challenges of the 21st century and actively committed to equipping their students with the skills and knowledge to tackle these, and in NYUAD I found all these things. I saw a university I could fall in love with, the same way I'd fallen in love with Mac.Rob, and that provided all the motivation I needed.

Gaining admission to this university was a big dream with a small chance of success — NYUAD's admission rate for the Class of 2022 was a meagre four per cent of over 12,000 applicants. I was also already behind, having only begun my application mid-Year 12 and the deadline looming a few months later. It felt like the kind of bold and daring goal my schooling had been preparing me to set my sights on.

The application process used everything from my toolkit: resilience, persistence, personal responsibility, drive, conviction, time management, organisation, writing skills, and — above all else — self-confidence. Finally, on the same day that ATARs were released (of all days), that determination to back myself and give it my best shot, earned me an admission letter and a full scholarship.

I realise that those who aim to study overseas are often seen by others as mould-breakers — and I'll admit that I haven't met too many high school students who've seriously considered the idea — but the truth is that it doesn't feel much like that from my side. Yes, the chance of success was much lower than any other goal I'd ever set, but the entire process of researching, committing, and following through was something I'd done a thousand times before at Mac.Rob, both within and outside of the classroom. It felt natural to aspire to something bigger, and to do whatever was necessary to get there.

Seven months later, I look back and see this journey as a culmination of all that I have learned from a girls' school. I remember the younger me who sat in that maths class five years ago, trying to dampen her own ambition based on her gender, and I compare her to the present me who refuses to self-impose any limits — gendered or other.

To me, girls' schools are somewhat of a beautiful paradox: it's actually by being separated, based on your gender, that you are able to free yourself from existing gender roles and expectations and let your ambition run wild.

After four years at a girls' school, you cultivate a stand-alone sense of self-belief that is separate from your gender, one purely based on your own skills and knowledge. You start to tune out external voices and focus more on the internal one, pushing you to see new possibilities you might have never previously considered, and to just go for exciting opportunities (including transnational ones). These learnings are the kind that impact major life decisions and alter life paths: what and where to study after high school, whether to apply for that position because you know you can do it even if you need to learn some of the criteria on the job (like a man would do), whether to start a business and grow it to a global scale.

Of course, I'm aware of the reality shock I will experience when I enter the 'real world' and rediscover that some pockets of society still loudly disagree with the basic notion that women are equally as valuable and competent as men; we still have a long way to go with changing these societal attitudes. However, I know that though others may restrict me based on my gender, I now refuse to do it to myself — and I have my girls' school education to thank for that. ▲

Determinants of success in single-sex schooling

DR KEVIN STANNARD, DIRECTOR, INNOVATION AND LEARNING, GIRLS' DAY SCHOOL TRUST (GDST), LONDON, UK

A recent report by Equate Scotland (2016) recommended that single-sex classes and clubs might help address the gender disparities in recruitment and retention around STEM subjects at school. Their survey found considerable support for this among female students (Sanderson, 2016).

Merely separating boys from girls does not guarantee success (Francis & Skelton, 2005). Indeed, many would argue that segregation without other changes, in culture and pedagogy for example, tends to reinforce rather than challenge the gender stereotypes and limited horizons that constituted part of the original problem (Fabes et al., 2013). Harris (2004, p. 103) warns that "schools have always been sites for the production of normative femininity and 'appropriate' young women". She argues that, "the space of schools is still designed to produce and regulate notions of appropriate young womanhood". Iris Bohnet (2016) argues that designing gender equality should start with de-biasing organisations instead of individuals. It is therefore necessary to isolate and analyse the range of factors that, together, constitute a convincing and credible single-sex offer in Girls' Day School Trust (GDST) schools in the United Kingdom.

1. The physical design of girls-only spaces

Individual thought and behaviour, group interaction, indeed all kinds of learning, take place within a series of physical spaces, that may or may not reflect and reward particular modes of being and particular learning approaches. Attention needs therefore to be given to the design of social spaces such as common rooms and study areas, but it also extends to landscaping. An example would be amphitheatre areas with small groups of seats – for use in spontaneous play by small groups of girls.

Play equipment in junior schools should be designed to encourage adventure (going for pirate ships rather than fairy castles) and controlled risk (modern climbing frames with modern safety nets). The girls themselves need to be closely involved in designing their own environment, and usually have high expectations with regard to environmental impact. Girls at several GDST schools have worked closely with teachers and architects to design new facilities – and environmental sensitivity has been a high priority.

Lang (2010) refers to Brisbane Girls' Grammar School, with its new Creative Learning Centre, designed by Michael Banney to group arts studies, and to serve all students as a meeting place and technology hub. The building was specifically designed to provide an environment adapted to teenage girls, and reflects their ways of learning and social interaction (see also, Bell, 2007).

Designs for new buildings in GDST schools currently seek to find spaces with supporting technologies for collaborative learning and small-group work. Consultation with pupils has been a key part of the process of designing new sixth form centres, and the result is that they tend to act as a focal point in the social as well as the educational life of the girls in the sixth form. A notable feature has been the way that girls have taken ownership of new spaces, spontaneously defining through everyday practice a gradation of learning and recreation 'zones' of different levels of formality.

2. Class time and classroom interaction

Belfi et al. (2012) found that single-sex classes are advantageous for girls' wellbeing and academic self-concept (the results are more inconclusive for boys). They reviewed evidence that girls tend to behave differently, and indeed are treated differently, in different settings, and found that girls are more likely to conform to gender stereotypes in mixed classes: "Gender is more salient in mixed sex groups than in single-sex groups" (see also, Jackson & Smith, 2000). Cribb and Haase (2016) studied levels of concern over personal appearance (the 'thin ideal') and self-esteem, and concluded that, "the presence of the opposite sex may inflate appearance concerns and lower self-esteem".

Girls-only schools can reflect girls' learning needs and preferences in the ways in which timetables are constructed, with schools adopting lesson lengths that are calibrated to the 'learning arc' that tends to be slightly longer for girls. Some GDST schools have moved to lessons of an hour —

which appears to be the ideal length of time to encourage deep learning. Forty minutes is too short, and the traditional 'double period' too long. Recent research certainly suggests that, typically, girls and boys function on different settings of the biological clock (Lusher & Yasenov, 2016).

The debate about the effect of school and class size on educational outcomes has, perhaps surprisingly, a gender dimension. Humlum & Smith (2015) review the evidence showing that boys rather than girls benefit from smaller classes and smaller schools. Classroom interactions tend to be different in girls-only environments, and teachers are able to give greater equality of air-time to individuals across the whole class. In single-sex classes there tends to be less peer-pressure, and consequent fear of failure — and correspondingly a greater willingness to explore, ask questions and take intellectual risks. Francis and Skelton (2005, p. 142) argue that, "single-sex classes provide girls a space away from the distractions of boys and they can provide opportunities for teachers to redress stereotypical constructions of particular subjects".

Some studies suggest that girls' interest in science can be increased by choosing particular topics over others: by presenting topics in a female-friendly manner and even by asking questions in particular ways (Kerger, Martin & Brunner, 2011; Murphy & Whitelegg, 2006; see also, Stannard, 2013). In girls-only classrooms procedures and interactions are very different. In lab classes, for instance, the pace can be dictated by girls' tendency to reflect and deliberate in planning an experiment, rather than by boys' preferences for leaping in and getting started.

IMAGE SUPPLIED BY THE GIRLS' DAY SCHOOL TRUST, LONDON, UK.

Bohnet (2016) refers to studies showing that 15-year-old girls in single-sex UK schools are just as willing to take risks as their male counterparts. This is supported by the findings of Booth and Nolen (2009) that single-sex environments tend to modify students' risk-taking preferences, with girls from single-sex schools as likely to adopt higher risk strategies as boys, and more likely than girls from co-ed schools. (See also, *Doing Gender in Classroom Discourse*, Laurel Center for Research on Girls, cited in Barker, 2015).

Gibbons (2012) and others have stressed the importance of providing an environment in which girls are encouraged to take intellectual risks, challenging answers which are prefaced by things like, "I'm probably wrong but...". In a study by three Essex University economists (Booth et al., 2011), undergraduates were put in a situation where they could choose between a safe and a risky choice (the latter potentially bearing greater reward). They found that after a period of time, females in all-female groups tended to act more adventurously than their counterparts in mixed groups.

The quality of classroom interactions depends on the pedagogical response, and therefore on the ability of teachers to recognise and respond to different learning preferences. Any group of girls will exhibit a range of approaches, and clearly a girls-only environment does not invite, nor will it benefit from a 'one-size fits all' approach. The purpose of any form of setting or segregation, by ability or by gender, is not to negate differentiation, but to gain a purchase on it. In single-sex classrooms, girls can be treated as individual girls, and differentiation can be far more focused.

Teachers in GDST junior schools observe that girls in Key Stages 1 and 2 [Years 1 and 2] tend to exhibit distinctive behaviours; for example, in seeking the reassurance of a clear plan. This might involve having the day's timetable clearly displayed, or lessons where girls engage very positively when teachers set out a summary of prior learning at the beginning and conclude with an indication of the next steps. There is a dark side to this, of course, of which teachers are well aware: girls tend to be more risk-averse, and will often want to start again if things go wrong. With groups of girls, teachers can address these issues, and exploit the opportunities, more directly.

Teachers tend to argue that there is nothing really 'lost' by not having boys around because in the primary phase boys and girls tend to play alongside, rather than with, each other. The principal of

Brisbane Girls Grammar School observes that, "What the teachers understand is that girls need to feel secure in their environment, they must be encouraged to feel confident about taking risks with their learning and, perhaps most importantly, they like to feel connected to each other" (Bell, 2007). In all-girls classrooms, girls can be appropriately challenged and encouraged to take risks and be adventurous in their views, attitudes, approaches and choices.

A US graduate quoted in a *Forbes* article (Henderson, 2014) reflected on her own experience in moving to a single-sex educational college [university] environment (a college which has since become co-ed): "Suddenly, no one in class called girls whores, sluts, slags. Nobody yelled 'faggot' at each other. All of the women and the teachers wanted to hear everybody's opinion. We all wanted to have discussions, not just 'be right' and 'win' the conversation. The airspace wasn't dominated with pointless vocal noise. Women spoke up, instead of being quiet to be popular."

3. Teachers and their roles

Eliot (2009) is generally sceptical of the claims made for single-sex education, but she argues that the greatest asset of successful single-sex schools is the gender composition of their staff: "At all-girls' schools, one finds strong, dedicated women serving as role models in maths and science." Campbell and Sanders (2002) argue that at college level, benefits follow from having a greater proportion of teachers who are female, and a positive learning environment which validates women's scholarship and women's issues: "The content, practice and organisation of an educational setting matter greatly when student achievement is being assessed." Eliot argues that even in co-educational schools, subjects like ICT and science might be better taught in single-sex settings, by teachers of the same sex as the students. For pupils in primary school, the teacher's gender matters in terms of the construction of pupils' own gender identities (Skelton et al., 2006).

While there is no doubt of the potency of female role models, the issue is less critical in schools that focus exclusively on the education of girls, and where the overall ethos of the school is focused on affirming and empowering women. Male teachers in such environments add balance and make a significant contribution in supporting the ethos of girls-only schools. However, there is evidence that merely teaching girls apart from boys is limited in its effect if teachers, of whatever gender, make no other (pedagogical) adjustments. Chambers (2005) studied single-sex language teaching in a co-educational comprehensive school and stressed the importance of the training of staff to avoid the tendency to regard boys and girls as homogeneous groups each with common needs rather than individuals with specific needs.

Teachers need an enhanced awareness of the challenges and opportunities of single-sex teaching (see Chadwell, 2010). Warrington and Younger (2001; 2003; Younger & Warrington, 2002) also found that single-sex teaching within co-ed schools had little impact on achievement levels in the absence of any pedagogical adjustments. This supports John Hattie's assertion that the impact of single-sex classes, like that of many other factors, tends to be mediated substantially by the quality of teaching per se (Hattie, 2009). Hahn and Wang (2012) concluded that the otherwise positive effect of single-sex schooling on academic outcomes is very context-dependent. An Australian study concluded that single sex groupings create environments in which teachers can implement gender-inclusive science instructional strategies more readily and effectively than in mixed-sex settings (Parker & Rennie, 2002). However, they found that the extent to which teachers were successful in implementing gender-inclusive instructional strategies depended on their prior commitment to the project as a whole.

Lesson observations and interviews with teachers, conducted as part of a research project led by Mike Younger from the University of Cambridge in which three GDST schools participated, revealed that while most teachers do not self-consciously adjust their pedagogy to the teaching of girls (and therefore do not recognise girls as having distinctive learning 'styles'), they do nevertheless calibrate their techniques to respond to girls' learning 'needs' – thereby developing a form of 'girl-friendly' pedagogy that exploits the advantages of a single-sex setting (Younger, 2016, pp. 23, 24):

> At one level, teachers' reflections suggested that they had not developed girls'-specific pedagogies, did not teach differently in a girls'-only classroom, or acknowledge that girls had different learning styles from those of boys. Classroom observations confirmed that a gender specific, girls'-orientated pedagogy was not explicit, and that – on the whole – classroom content and curricular focus was not gender specific. At the same time, however, teachers seemed to recognise that the girls they taught needed both more security and more challenge if they were to maximise their potential as learners. Whether this is gender-specific or not is arguable, since many boys of similar abilities need challenge and some of them certainly need more security than they might care to admit publicly. What seems unarguable, however, is that many of the observed teachers in these schools had adjusted their pedagogy, whether explicitly or implicitly, to context, to provide secure environment for learning whilst at the same time building in challenges which increased girls' resilience and criticality … What emerges here, then, in the practice and voices of the observed teachers is that the pedagogy which has developed – almost organically - within these schools, might not acknowledge that girls learn differently or have different learning styles to boys per se, but that teachers have developed and evolved a style of teaching and approaches to learning, sometimes almost sub-consciously [sic], which has optimised the context of girls'-only classes. "The feel of the lessons is different … the way the girls act, the teachers interact, the rapport established between girls and teachers all have emerged through time … enabled by the single-sex environment", and that practice has become implicit, based on experiences and on "what works, when, with whom".

4. Curriculum choices, leadership and co-curricular opportunities

Subject choice, according to the Institute of Physics (2012) is strongly associated with and influenced by students' own developing sense of identity, and how they see themselves in relation to a particular subject — something that is influenced by the context: girls are almost two and a half times more likely to go on to do A-level physics if they come from a girls' school rather than a co-ed school. The *Closing Doors* report (Institute of Physics, 2013) found that "single-sex schools are significantly better than co-educational schools at countering the gender imbalances in progression" across a range of subjects, including physics. Even those sceptical of the academic advantages of all-girls schools tend to accept that by eliminating the boy-girl contrasts that inevitably arise in mixed classrooms, each sex might be freer to excel in a wider range of pursuits (Eliot, 2009). GDST schools' refusal to allow girls to typecast themselves according to others' perceptions is reflected in the distinctive and wide-ranging subject choices, and subsequent degree course choices, of GDST girls, when compared with girls nationally.

With respect to curriculum, arguments for single sex education do not fall back on (questionable) assumptions or assertions about gender differences in attainment or interest in particular subjects, nor on any assumed underlying cognitive differences. It actually isn't very important whether we think that girls are typically less interested in mathematics or science, or whether we think that more of them should be. The essential thing is that every opportunity is provided for girls to make up their minds freed from the undue influence of prejudice — their own and other people's.

Co-curricular and leadership opportunities in girls-only schools reflect the fact that, across the curriculum and outside the classroom, roles are not pre-determined, and girls don't play second fiddle to anyone — in fact in the absence of boys they are just as likely to take up the trumpet. Meehan (2007, p. xvi) observes of single-sex schools, "In the best of these schools, girls make most of the rules. In all of them, girls play all the roles: girls are the clowns, the chemists, the classical scholars". She argues that, free from the judgement of boys, girls are active, not reactive. She also argues that in a single-sex environment, the pressure to 'grow up' is reduced, and girls are able to remain longer in the 'in-between years'.

A single-sex education only seems artificial if one assumes that girls are one-dimensional, and that formal schooling constitutes the totality of their lives. Girls have lives outside school. Balancing social life and study is itself a skill, and girls-only educational environments help pupils to achieve a balance by creating spaces for girls to learn without the continuous imposition of social pressures and distractions. That said, many GDST schools organise joint co-curricular activities with local boys' schools — including plays, debates, fashion shows and careers fairs.

5. The whole-school environment

Eliot (2009) is sceptical of most arguments for single-sex schooling, but she concedes that their proponents are on firm ground when they base their arguments on some of the motivational and interpersonal differences between the sexes — particularly the idea that individuals might benefit from some protected time away from the other sex during their formative years. Boys, she conjectures, might thrive in a more disciplined, competitive atmosphere, while girls are more likely to thrive in a more supportive, nurturing environment.

The effect of single-sex education is marked for whole schools, but not necessarily for segregated classrooms in co-ed schools. Riordan (2002) stresses the importance of "an academic culture that is endemic to single-sex schools and cannot be produced in one or two classrooms within an otherwise coeducational school". Murphy and Whitelegg (2006) suggest that single-sex teaching in co-educational schools might even run the risk of reinforcing gender stereotypes — possibly by implying that girls have difficulty with particular subjects (see also, Gill, Esson & Yuen, 2016). Limited separation by subject would indeed tend to ignore the whole-school dimension, including co-curricular activities and leadership opportunities.

Smith (1984) outlines the difficulties involved in ensuring equal opportunities in co-ed classes and schools. Outcomes for girls in single-sex settings within co-ed schools might be questionable, not least because such initiatives have been mostly driven by the need to raise the standards of boys. Francis and Skelton (2005, p. 142) argue that "single-sex classrooms are only effective in those schools with a whole-school approach to gender and not in those establishments which had adopted it on an ad hoc basis". This is a view that is strongly supported by Leonard Sax, the US psychologist (Hepburn, 2013).

But even whole-school single-sex environments alone don't guarantee success: they might still serve to underwrite rather than challenge gender stereotypes. They need to provide a culture and a set of structures that serve to challenge risk aversion and encourage a sense of adventure. Kruse argues that, "sex-segregated education can be used for emancipation or oppression. As a method, it does not guarantee an outcome. The intentions, the understanding of people and their gender, their pedagogical attitudes and practices, are crucial, as in all pedagogical work" (quoted in Datnow & Hubbard, 2002). Segregation might conceivably leave structural inequalities intact, with academic outcomes depending more on school factors than on gender separation; and single-sex educational settings might promote stereotypical gender roles and attitudes towards the opposite sex (Datnow & Hubbard, 2002). Whyte (1985) argues that "it is probably true that many single-sex schools have a tendency to reinforce the traditional aspirations of boys and girls".

The issue here is the need to balance recognition of gender differences with avoidance of gender stereotyping — something which schools of all kinds have to address.

Boaler and Sengupta-Irving (2006) argue that, "while the 'dichotomous' argument carries the danger of essentialism and stereotyping, the counter-argument, that gender differences do not exist, runs a different risk – that of overlooking the harsh inequalities that prevail in many places and that cause unequal achievement and participation". There is no a priori reason why single-sex schooling should fail to challenge gender stereotypes, except insofar as it is bound up with social and/or academic selection.

Historically, the single-sex strategy in Australia was associated with private schools, with the result that outcomes were vulnerable to class-specific gendered subjectivities rather than non-sexist schooling (Kenway & Willis, 1986). A New Zealand study found that selective single-sex schools are chosen not just because of access to academic achievement, but for the type of girls they are seen to be able to produce. Parents, and the girls themselves, have ideas about femininity which they seek to have reinforced by the school (Watson, 1997). Fee-charging (and therefore to an extent socially-selective) girls' schools face a particular challenge in avoiding the reproduction of the very gender inequalities they seek to subvert.

Halpern et al. (2011) ask whether 'segregation' reinforces or subverts stereotypes and gendered behaviour. This links in very clearly with the proposition that sex selection in and of itself changes nothing, without concomitant commitments reflected in the principles and articulated in the practices of the school. Indeed there might be a danger of legitimising striving for perfection across the board, associated with intensive pressure, and overscheduled, stressful lives (Maxwell & Aggleton, 2013). Lee, Marks and Byrd (1994) stress the need for girls-only schools to actively discourage academic dependence in their pupils.

The GDST Cambridge study referred to previously (Younger, 2016), stresses the importance of the cultural milieu created and maintained from the top down — with strong and empowering messages coming from the head and senior leadership team, and carried through in practice, in assemblies, presentations, displays, and co-curricular programmes. The role of girls' schools in this context goes well beyond gender, of course. It involves educating pupils within an ethical framework of self and society — and as such schools are not cut off from the wider world. Core curriculum components and extra-curricular activities are often focused on developing this aspect of a pupil's whole education. An explicit purpose of GDST schools is thus to challenge and subvert stereotypes per se, and to empower their pupils to make informed, unconstrained and responsible choices. ▲

IMAGE SUPPLIED BY THE GIRLS' DAY SCHOOL TRUST, LONDON, UK.

This is an edited extract from the GDST publication, Girls-only education: The GDST perspective, *in which Dr Kevin Stannard summarises the recent research on single-sex education, neuroscience, gender stereotyping and pedagogy, concluding that there is strong evidence that girls-only education leads to higher academic achievement, greater diversity of subject choice, and enhanced career progression. A copy of the full report, including details of all references and sources listed above, can be downloaded from the Alliance website: https://www.agsa.org.au/reports-about-girls-education/*

A woman's place: Researching experiences of female graduates of all-girls schooling

DR REBECCA ENGLISH, QUEENSLAND UNIVERSITY OF TECHNOLOGY

Introduction: The recipients of the 2019 Alliance Research Grant are Dr Rebecca English and Professor Raechel Johns, whose study will examine the life outcomes of graduates of all-girls schools in Australia and New Zealand. Rebecca and Raechel have been friends since their days as students at All Hallows' School in Brisbane. They have long maintained an interest in exploring how attendance at an all-girls school has moulded the post-school experiences of alumnae of all-girls schools — not just in terms of educational outcomes, but also in their employment, leadership, and in broader life success and happiness. In this article, Rebecca explains how she and Raechel formed such a strong friendship and the impact it has had on their careers and research interests. This friendship has culminated in a joint major research project for the Alliance, that will combine existing data on female life outcomes with a large-scale survey of all-girls school alumnae. Rebecca and Raechel's study will be completed in December 2019 and their final report will be available to Alliance members in early 2020.

Raechel and I first met at secondary school. We went to an all-girls school in Brisbane and finished school in 1993. Outside my own family, Raechel is the person I've known the longest. I have other friends I met at university and beyond, as well as my husband whom I met when I was at school, but it is Raechel that I've known since we shared a Year 8 form class at All Hallows' School in 1989.

We lost touch for a while after finishing school, but when we reconnected, we spent many hours exploring education and the role of schools in providing a social service. We regularly discussed how and why our school in particular influenced the women we are today. We even wrote papers and edited a book about gender experiences in online spaces to explore our reconnection and experiences as women who met at school and now work together. While we were researching the introduction to our book, we looked at the data on girls' schools and found something was missing: the gap was how the experience of attending a girls' school influenced the women who lived it. There is plenty of research on old boys' networks, but very little exists on old girls' networks. The literature suggests this is due to the lack of women in leadership roles who can help other women through the ranks. But we were interested in many aspects, not just women in leadership. How did all-girls schooling shape their lives more broadly?

True enough, there is plenty of work on the academic outcomes of girls' schooling. This research finds that graduates of all-girls schools have better academic outcomes and, in relation to maths and science in particular, outperform their co-educationally schooled peers. Women who go to all-girls schools are also more likely to have a 'career', be satisfied with that career and hold a university degree that supports that career. These outcomes are often explained using the social class of the women who attend the schools (the argument that suggests "they were of good, middle class families, so they were always going to be successful, regardless of schooling") or the fees paid by parents (the argument being that "if their parents can afford to pay for it, they wouldn't let their daughters waste their money") or any number of other measures. These arguments include the quality of the teachers in all-girls' schools, the quality of the resources, the expectations of the schools, and the weight of their reputations. But these outcomes and their explanations weren't a good fit with our experiences. They failed to get to the depth of our experience and the impact it has had on our lives.

So, we asked ourselves, how would we collect data on our experiences? The experiences — and ours are vastly different from each other, I hasten to add — of meeting people who support you through your life; knowing people who have your back, so to speak; finding colleagues amongst your friends.

After talking with the Alliance, we discussed the prospect of researching that question: the question of how the experience of education in an all-girls school affects your

life outcomes, not in terms of academics or career alone, but also in terms of the support and, in the language of the theoretical lens we are applying to our study, the affect of the experience and the cultural capital you accrue from being educated in an all-girls school.

At the risk of answering a qualitative question with a quantitative measure, we decided to undertake a review of existing data and host a survey. The existing data we have drawn on comes from a number of government and non-government sources. We are trawling it, with another graduate of an all-girls school, to find out how girls fare over their lives, and their academic and career outcomes.

Our survey uses established psychological metrics to find out how the social and affective outcomes of all-girls schooling are experienced by the women who graduated from those schools.

IMAGE: (L–R) REBECCA AND RAECHEL,
1993 VALEDICTORY DINNER, ALL HALLOWS' SCHOOL

Our survey uses established psychological metrics to find out how the social and affective outcomes of all-girls schooling are experienced by the women who graduated from those schools. As qualitative researchers, we are dealing with the survey as a blunter instrument than we are accustomed to. We accept and value that a survey of this nature will produce 'scientific' data, and indeed, a larger sample size than interviews would allow. We also hope to have the opportunity to expand our study to incorporate qualitative instruments, such as focus groups and interviews. Several respondents have expressed an interest in being involved in interviews, which demonstrates the depth of feeling our study has reached. One day, we may seek to collect the same data from females who attended co-educational schools, to provide a richer comparison.

In the survey, we are collecting not only demographic data, about when the graduates finished their schooling and what they did after that, but also, using psychological questions drawn from established psychographic instruments, about the affective and the social elements of their experience, correlated with measures of optimism, too. This data fills the gap we have identified. The gap is around the affective and cultural experiences of girls' schooling.

By affective, we mean the pre-cognitive experiences and responses people have to different situations. These are the embodied experiences and the states of mind that relate to more than emotions; they are the ways we perceive, and experience, the encounters and interactions we all have in our daily lives. Affect theory is a lens we can use to understand these experiences, and the psychological measures we have chosen allow us to access that data and will facilitate us publishing our findings in peer-reviewed journals.

By social elements, we are referring to the ways that certain relationships and social connections are developed and deployed through the school and how these relationships and connections help people throughout their lives. The theory underpinning this element of our study is social capital, which is a resource, like any other, that people use to help themselves when they want to achieve a goal. Perhaps this is the power of the old girls' network? Certainly this study wouldn't have happened without it.

We are greatly encouraged by the large number of all-girls school alumnae who have participated in the survey and hope that it will lead to more research into the area. It is hoped that we can produce data which demonstrates that the experience of all-girls schooling has implications and ramifications across all of our life phases, beyond glib platitudes like, "Well, of course she did what she did — she went to an all-girls school!". ▲

My year of reading women

KIM ELITH, DIRECTOR OF CURRICULUM, QUEENWOOD SCHOOL FOR GIRLS, NSW

There has been a phrase in circulation in popular feminist writings: *You can't be what you can't see*. Originally attributed to the American children's rights activist Marian Wright Edelman, this quote has found new life in a range of contexts, with regards to the pursuit of equal opportunities for women: women in sport, women in STEM, women in leadership. It got me thinking about my own work in education: How do the young women in my English classroom see themselves in literature?

I am of a certain generation where an education in English literature at a sandstone university meant three years (plus an honours year) essentially tackling the works of "dead white males". Sure, there was the odd diversion into the works of the Brontes, Austen and Woolf (and even Helen Garner got a quick mention in third year), but overwhelmingly the books I came to know and passionately love, were those written by men in eras where women were firmly kept on the margins of power. In turn, I have spent over 20 years in the classroom continuing to uphold the glories of such men. There always seems to be good reason to keep some works from the "canon" alive from one generation to next.

Lists of prescribed texts generated by curriculum bodies reflect changing contexts, values, genres and perspectives (rightly so, too) but it is still pretty easy to ensure a Shakespeare is "done" every year, the Romantic poets are squeezed in and my Year 12s get to find out why "The Great Gatsby" is one of the greatest novels of all time. Yet having moved into single-sex girls' education in the last few years, I have started to second guess myself. Your values are the product of your relationships and experiences; my foundational literary values have been profoundly shaped by an imbalance of studies in literature composed by men, and by classes and lectures largely delivered by male teachers and professors. Now I see this as a problem in girls' education; I must break the cycle and invert the proportions.

In order to do this purposely, I made a pact with myself that for one year I would more proactively ensure my leisure reading consisted predominantly of literary fiction and non-fiction by contemporary female writers, whose works populate the national and international book award lists. Of the 16 books I've read for pleasure since the beginning of 2019, 11 have been by female authors. The women I've encountered in these books have included an African American twenty-something blindsided by the arrest of her husband in the first year of their marriage, who then seeks solace in the arms of his best friend; another two twenty-somethings in England navigating the complexities of university life and some kind of love to pass the time; and a mythological goddess reimagined, who spends her existence in a state of exile and loneliness until she finds the "right" man. The current novel I'm immersed in, tells the life of a young twenty something experiencing love and sex for the first time in the theatre world of 1940s New York. Don't get me wrong, the novels I've read so far have all been nuanced, beautifully crafted and highly engaging, but I think I was looking for something else when I embarked on this reading journey. I assumed that the female protagonists in these contemporary works would pass the literary equivalent of the Bechdel test.[1] Yet at the heart of every work so far is the pursuit of love and happiness (with the correlation that love with a man or a woman will eventually bring a sense of wholeness that each woman seeks). I thought I was going to find something completely different, to bring to the young women in

1 The Bechdel Test is a simple test which names the following three criteria: (1) it has to have at least two women in it, who (2) talk to each other, about (3) something besides a man. Retrieved from https://bechdeltest.com/

IMAGE: JAMES GREEN 2019

Girls should have opportunities to read, view and listen to literary and non-literary works that mirror their own experiences and those that represent a broad range of what it is to be a woman through varied contexts and situations.

my classes, about what it is to be female in the literary fiction of the 21st century compared to the works of the traditional literary canon.

My realisation is: maybe and *maybe not*.

It has given me food for thought on how to frame the canon in a different way. It has made me more conscious to emphasise the *human* experience; to communicate how the big ideas transcend gender, yet also contain and restrain it. I've been drawn back to first principles: canonical works become so because they represent every possible human experience, emotion and thought in grand ways or in specifically contextual ways; as a reader you see yourself and realise that is exactly how you've felt in a similar situation, or you know people just like that in your own life. Or alternatively, you have never been in such a context or situation, so instead build empathy with the characters through the compelling story, and through the magic and craft of language and form. There is a place in single-sex education to make curriculum choices that reflect and connect specifically with the chosen gender. Girls should have opportunities to read, view and listen to literary and non-literary works that mirror their own experiences *and* those that represent a broad range of what it is to be a woman through varied contexts and situations. These choices don't have to be at the expense of "great works"; they can and should happily co-exist.

Works that allow girls to see themselves are vital. Works that allow girls to see the world now or in the past how they don't want to be are also vital.

As Neil Gaiman and Chris Riddell (2018) recently asserted in their essay in pictures on why we need libraries (and by extension, literary works including the canon),

> You're finding out something as you read that will be vitally important for making your way in the world. And it's this: the world doesn't have to be like this. Things can be different. ▲

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Tech girls really ARE superheroes! Tales from the field

DR JENINE BEEKHUYZEN, FOUNDER AND CEO OF ADROIT RESEARCH

What is your superpower? Tech Girls Are Superheroes is the signature campaign of the Australian not for profit Tech Girls Movement Foundation (TGMF). The campaign breaks down outdated STEM stereotypes, presenting real life women in STEM as superhero characters who change the world. This has been achieved through the 80,000 free books that have been distributed to schools and individuals across Australia and New Zealand — with one in every Australian school, and through the successful Search for the Next Tech Girl Superhero competition (SNTGS), a 12-week STEM entrepreneurship programme.

Literature review

"Though girls often tend to perform at the same level as boys in these areas, as early as middle school they begin to veer off from these career paths due to a lack of educational support and a fear of failure" (Lee, Min, & Mamerow, 2015). Many authors believe that the gender disparities in STEM fields can be improved through the use of outreach programmes (Chen et al., 2011; Colvin, Lyden, & León De La Barra, 2013), with some of these being single-sex programmes like the Search for the Next Tech Girl Superhero competition.

But are single-gendered environments necessary for girls to learn, participate and engage in STEM? Safe spaces, defined as "counterspaces" by Case and Hunter (2012), have the ability to "enable individuals who experience marginalization and oppression to achieve well". In early works, counterspaces were discussed in terms of politics as resistance in conflict zones (Shalhoub-Kevorkian, 2005) and more recently in terms of diversity and LGBT support (Cerezo & Bergfeld, 2013).

This growing body of literature highlights the importance of contexts in facilitating processes that result in wellness among marginalised individuals. Counterspaces are theorized to enhance wellbeing by challenging deficit-oriented societal narratives concerning marginalised individuals' identities, "thus necessitating spaces in which the effects of marginalization may be countered" (Case & Hunter, 2012). Such counterspaces can also be supportive for groups outside the mainstream of STEM education. Although Ong, Smith & Ko studied counterspaces for women of colour, we argue that such safe spaces could help women, as a minority in STEM, to look for commonalities and not differences among them (Ong et al., 2018).

In an interesting discussion on single-sex science programmes for middle school students and their STEM identity formation, Hughes, Nzekwe and Molyneaux (2013) refer to US policy debates about the efficacy and legality of single-sex formal and informal education programmes. They argue that this "issue is particularly poignant in science education due to the historical marginalisation of women in these fields, who have been positioned as a stigmatized group within STEM". They posit that this "marginalization has resulted in women being positioned as a stigmatized group within many science, technology, engineering, and

... we engage girls and build their skills, which help to build confidence, while the team work and mentorship help to grow courage.

mathematics (STEM) related fields".

Based on the view that adolescence is the age where this sense of marginalisation begins to develop (other research suggests this happens from as young as six years old), the authors compare middle school participants' STEM identity formation during two informal science learning environments (an all-girls' STEM camp and a co-educational STEM camp). Focusing on the provision of role models and authentic STEM research activities as ways to improve STEM identity and make these fields relevant to the lives of middle school students, they found that both camps improved girls' STEM identities. They argue that the single sex environment "is not as important to STEM identity as the pedagogy used within the program".

STEM + entrepreneurship = the programme

Now in its sixth year, the Tech Girls Are Superheroes programme is changing the way girls perceive and engage in STEM. The programme combines problem solving through a social, business and technical lens, producing high quality business plans, pitch videos and working app prototypes from girls as young as seven up to 17 years. Through highlighting pathways and role models, and connecting teams with female mentors, we engage girls and build their skills, which help to build confidence, while the team work and mentorship help to grow courage. This paper discusses the programme's highlights, its challenges, and opportunities for the future.

The successful annual Search for the Next Tech Girl Superhero competition has grown from 16 girls in the first year in 2014, to more than 1,000 girls over the past three years across Australia and New Zealand. The goal of the Tech Girls Movement Foundation is to engage 10,000 girls directly in STEM Entrepreneurship by 2020. This target is reachable based on current numbers.

There are seven member schools from the Alliance of Girls' Schools Australasia competing in the 2019 programme. Spread across Queensland, New South Wales and Victoria, there are 36 teams vying for the opportunity given to the winner of the programme: to pitch their app in Silicon Valley in 2020. A team from St Aidan's Anglican Girls' School travelled with us to Silicon Valley in August 2019 to pitch. Teams from St Aidan's have won the competition and visited Silicon Valley for the last three years in a row, with outstanding teams presenting solutions to problems in their local community such as teenage depression, finding part time work for those with autism, and helping the homeless community. In addition, Brigidine College, Indooroopilly in Brisbane and Santa Sabina College in Sydney have both celebrated state finalists among their students.

This paper combines perspectives on education, STEM and entrepreneurship through this comprehensive online programme that is giving schoolgirls skills, confidence and abilities. Combining access to hands-on technology with technical skills, business acumen and public speaking experience, alongside project management and teamwork, this impactful programme approaches the concept of 'get kids coding' in innovative new ways that engage girls.

The research

The signature Search for the Next Tech Girl Superhero (SNTGS) competition and other TGMF initiatives are soundly based on international research into how best to encourage female participation in STEM-related careers and education. The TGMF has administered both pre and post-competition surveys for all participant groups (schoolgirls, mentors and coaches) for the past three years of the competition. This paper focuses on the results from 2018. The same survey with minor adjustments is administered each year. It consists of open and closed questions, drawn from three sources — an internationally recognised instrument for measuring STEM career interest (Kier, Blanchard, Osborne, & Albert, 2014); a survey carried out by Technovation, the organisation which provides the curriculum on which the competition is based (Rockman, 2016); and the results of interviews carried out with eight mentors from the 2015 competition.

In the Australian Search for the Next Tech Girl Superhero (SNTGS) competition, girls form teams and register on the TGMF website via a coach — a teacher or a parent who becomes the contact point for the team. One coach may have multiple teams. Each team is then matched with a female mentor working in STEM who commits to meeting the team virtually or, if co-located, in person, for with a female mentor working in STEM who commits to meeting the team virtually or, if co-located, in person, for one hour per week for 12 weeks. Teams then brainstorm problems that bug them in their local community, from personal problems such as anxiety, mental health, wellbeing or healthy eating, to broader school issues such as lost

property, or family issues such as “Grandad can’t read” or wider issues such as sun safety or global warming.

Teams then research how others have tried to solve the problem around the world, and then they design their own solution to the problem through a business plan and a wireframe. Teams with girls as young as 11 years old are building 50-page business plans. Once they have a wireframe and business plan, they build the working prototype through free online software such as AppInventor. Then they develop a four-minute pitch video to sell their idea, and a three-minute demo video to exhibit how their app works.

Technovation

In Australia, TGMF are the Regional Ambassadors for the global Technovation Program, which is a similar worldwide programme for girls and entrepreneurship. Based in San Francisco, the TGMF draws on the Technovation curriculum for our localised version of the curriculum that TGMF developed.

Technovation runs each year from October to April, which does not suit the Australian education schedule. Thus, the Search for the Next Tech Girl Superhero competition purposely runs in Term 2, from May to July each year. Entries are judged in August — each entry by at least three industry judges. Then public community showcases are held for teams to expo and pitch their apps. Once our programme is completed, teams can then ‘double dip’ and submit their app to the global competition for more mentoring and technical help, and another opportunity to win. The top 12 Technovation teams from around the world (finalists) are then flown to pitch at an event in Silicon Valley.

In 2017, one of our winning Australian tech girl teams made it into the top one per cent of Technovation entries, narrowly missing out on being top 12 finalists. In 2018, three more of our competing tech girls’ teams were named in the top 100 teams around the world, from among more than 3,500 teams. Alongside the Technovation pitch event in August each year, the TGMF takes winning teams to spend a week in Silicon Valley. Winning teams from the previous year are given the opportunity to genuinely pitch their apps and business ideas to top engineers and technologists at Google, Facebook, IBM, Salesforce, Accenture, eBay and more. Engaging with these organisations, and with innovators (on invitation) from NASA’s Ames Research Center or Apple in the world famous Rainbow Mansion, our tech girls, as young as nine years old, are given the opportunity to truly be taken seriously, in terms of their already built solutions, and in terms of their future aspirations. This year, 2019, will mark the fourth year we will take female students to Silicon Valley, totalling 42 students across four year levels, plus chaperones.

Method

The post-competition surveys aim to evaluate the impact and success for student participants in the Search for the Next Tech Girl Superhero competition. Specifically:

- The impact of participation in the competition on girls’ self-perception and career perception in relation to STEM, and of their intentions to pursue further studies and careers in STEM-related fields. The evaluation is based on well-established research in this area.
- Students’ perceptions of the curriculum areas. (The evaluation does not attempt to measure objective improvements in skills because of wide variations in curriculum, facilities and teacher practices.)
- The issues, benefits and problems of participating in the competition.

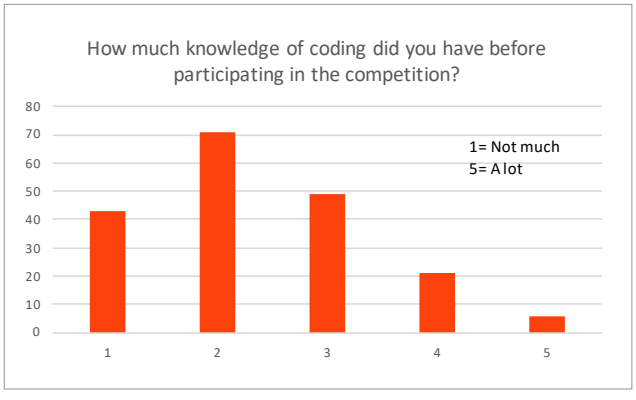
In 2018, the demographics of the 191 respondents were very similar to those from 2017. Most of the girls live in Queensland (90) and New South Wales (50). Of the New Zealand girls represented in the 2018 survey, more live on the South Island (10) compared to 2017 results where more were from the North Island. Most students attend co-educational schools (117) and are currently in Grade 6 (48).

Results

Several areas that showed improvement in 2018 were students’ time management, support from mentors and coaches, and satisfaction with teamwork.

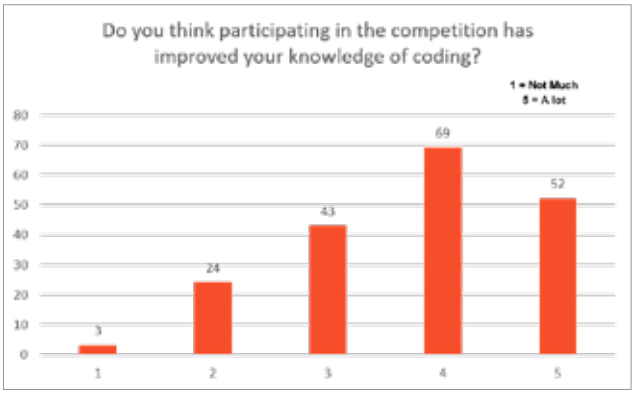
Students are asked how much knowledge of coding they had before participating in the competition. Most reported less than an adequate amount of knowledge of coding.

FIGURE 1: 2018 STUDENTS’ PREVIOUS CODING KNOWLEDGE



Although the students’ perceptions of their knowledge of coding in 2018 was reported to be similar to 2017, there was a substantial increase in their perceptions that participation in the competition had improved their knowledge of coding (from 58 to 85 per cent).

FIGURE 2: 2018 STUDENTS' IMPROVEMENTS IN CODING KNOWLEDGE



The Curriculum

In relation to the curriculum, the Revenue lesson continues to be the least popular, and students wished there had been more focus on coding, even though their perceived competency in coding increased substantially. The biggest challenge reported was shortage of time.

The programme consists of the following 12 lessons. Lessons 8 and 2 are the most popular, and lesson 7 the least popular.

- Introduction to the curriculum and meet your mentor
- Defining the Issue
- Brainstorming Solutions
- User Centred Design
- Competitive Analysis
- Branding and Promotion
- Potential Revenue
- Pitch Guidelines
- Demo Guidelines
- User Feedback
- Video Editing
- Submission!

Student Support

Overall the support from schools, coaches and mentors is perceived as good or satisfactory, and the students thought they worked well in teams. A small percentage reported that team members dropping out caused problems. Responses to the questions regarding attitudes to STEM showed similar improvement after participation to that of the 2017 survey. Some of the questions regarding career interest showed a small improvement over the 2017 results.

Motivation to participate in the competition

In 2017, twelve girls mentioned that their involvement in the competition was due to it being a part of their school curriculum; this was not mentioned in 2018. The most frequent responses in 2018 were: to learn about coding, to work with friends, and solve problems (similar results to those of 2017). More students in 2018 mentioned being encouraged to participate by friends and/or siblings who had previously participated in the competition.

Benefits gained from participation

Students gained a variety of benefits and experiences from their participation in the competition.

> The benefits that I have gained from participating in this competition have definitely been time management and organisation. Also developing new skills that I can apply to many other things such as my vocabulary, speaking on the spot, persuading, my writing skills and other larger topics I had no idea about, such as potential revenues and other elements within the business plan. Other benefits I have also gained from this competition are qualities such as commitment, trust, teamwork, prioritising and thinking about the bigger picture.

The students' motivations and expectations focused mostly on their desire to learn more about coding and to work in teams. In 2018 students were encouraged to participate in the competition through friends or siblings who had participated in a previous competition or knew someone who had.

Conclusion

While some respondents stated that they had always been interested in technology and their participation in the competition confirmed this interest (25), some now felt they were more likely to consider a science or technology career than before (22). Importantly, 26 responded that their confidence, awareness, knowledge or interest in technology had increased, but not necessarily relating to a direction in study.

> I believe from the competition our interest in technology is enhanced because of the amount of time and effort we put into using technologies. I believe the competition has made us more confident in starting a new business or designing and developing new ideas from technology. The experience was positive and worthwhile.

> My mind was open to ideas, but the Tech Girls competition has pointed me in the direction of technology.

> Tech girl Superheroes has taught me that I can do whatever I want in the future ... this competition has influenced my life greatly and I have become a more confident, better person because of it.

The students' motivations and expectations focused mostly on their desire to learn more about coding and to work in teams. In 2018 students were encouraged to participate in the competition through friends or siblings who had participated in a previous competition or knew someone who had.

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Single-sex schools in a gender diverse world

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The world is currently in the midst of what is being described as a 'gender revolution' (Kouric, 2017). At the centre of this gender revolution has been a bourgeoning awareness of gender identities and expressions that may or may not align with the binary gender system. The binary gender system assumes that there are two distinct and opposite classifications for gender identity, male and female. According to this system, male and female gender identity accords with an individual's biological sex and biological sex determines feminine or masculine gender roles and behaviours (Butler, 1990).

The term gender identity has been defined as "a person's innermost concept of the self as male, female, a blend of both or neither," while gender expression refers to "the external presentation of one's gender, as expressed through one's name, clothing, behaviours, hairstyle or voice" (Telfer et al., 2018, p. 4). Gender diverse is an umbrella term that has emerged to describe "individuals who do not conform to their society or culture's expectations for males and females" (Telfer, et al., 2018, p. 4). 'Gender diverse' encompasses individuals whose gender identity does not align with the biological sex assigned to them at their birth. It includes individuals whose gender expression may or may not conform to socially constructed and enforced masculine or feminine behaviours and characteristics that are typically associated with being either male or female.

While being mindful of the dangers of simplifying the spectral and multifaceted nature of gender identities and experiences, transgender, non-binary and gender fluid are some of the most common terms that are being presently used for further categorising individuals who are identifying under the umbrella of gender diverse. People who are transgender live with the profound sense that the male or female gender assigned to them at their birth (based on perceptions of biological sex) is wrong and may or may not seek a transition to align their sex characteristics with their subjectively felt gender identity (Telfer, et al., 2018, p. 4). However, some individuals reject the binary gender system altogether, choosing to live a non-binary life by not identifying exclusively as male or female. There are also individuals who identify as gender fluid and perceive their gender identity as varying with time (Telfer, et al., 2018, p. 4).

The contemporary context, with its increasing global awareness of diverse gender identities, has necessitated evolving ways of understanding gender identification and expression across a range of social and cultural fields. One such field that is significantly impacted by the phenomenon of gender diversity is education as its institutions, from kindergartens through to universities, have traditionally focused on fixing students into binary male and female gender categories based on perceptions of a student's biological sex (Ferfolja & Ullman, 2017; Jones, Smith, Ward, Dixon, Hillier & Mitchell, 2016). From gendered subjects such as home economics for girls and woodworking for boys, to the subtler practice of steering males towards physics and females towards biology, the curriculum reinforces gender stereotyping on a daily basis. In addition, the provision of female and male sporting teams and activities, as well as gender-separated facilities such as toilets, locker rooms and boarding accommodation, ensures that educational spaces continue to be highly gendered. However, the last decade has seen an increasing number of students expressing a gender identity that does not accord with the sex that was assigned to them at their birth, necessitating a growing body of critical research into the gendered structures of education environments.

While a lack of publicly available data makes it difficult to confirm the exact number of gender diverse students, the Australian figure is currently cited at approximately 1.2 per cent (The Royal Children's Hospital Melbourne, 2018). While this reads as a small percentage, it equates to approximately 45,000 students identifying as gender diverse.

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Over the last decade, research has demonstrated that schools can be particularly hostile spaces for children with diverse gender identities to navigate (Nicholas, 2016; Jones, Smith, Ward, Dixon, Hillier & Mitchell, 2016). In addition, gender diversity among young people has become a more visible and accepted phenomenon, perhaps due to growing recognition and acceptance of gender diversity within public policy, the media (Dow, 2017; Caldwell, 2017) and academic literature (Singh, Meng & Hansen, 2014; Ferfolja & Ullman, 2017; Barron & Capous-Desyllas, 2017; Hill & Menvielle, 2009), as well as parenting practices that are increasingly choosing to recognise children's unique gender identities (Averett, 2016; Pyne, 2014, 2016).

The sociological and medical literature is increasingly encouraging an affirmative, rather than reparative, approach towards gender diversity in children. This is prompting more parents to support their child to confirm their felt sense of gender from younger ages (Hill & Menvielle, 2009). Specialist clinics providing gender-affirming treatments have been established and legislative changes have opened up possibilities for Australians (namely those identifying as transgender) to access medical and surgical treatment options for confirming their gender identity (Caldwell, 2017; Human Rights Law Centre, 2018). With support from their parents or guardians and medical professionals, children as young as ten years of age can now begin the process to access hormonal and other treatments to transform their bodies (Lander & Rogers, 2017).

Single-sex schools, in line with other sectors that comprise Australia's education landscape, are increasingly recognising the need to make their school climates more welcoming for gender diverse students. Several single-sex schools (Wahlquist, 2017) were among the 500 schools that became signatories of the *National Safe Schools Program* that was introduced in 2013 and the Australian media has reported on a number of single-sex schools that have accepted or maintained the enrolment of a gender diverse student within their school communities[1]. A survey study commissioned by the Alliance of Girls' Schools Australasia in 2018 to investigate policies and practices regarding transgender students in Australia and New Zealand also found that, of the 59 participating all-girl member schools, 85 per cent reported experiencing or having had experience of a gender diverse student (Alliance of Girls' Schools Australasia, 2018).

In many regards, the fast pace of social change in this area has outpaced the available research. While the adverse impact of negative school environments on the poor mental health and academic outcomes of gender non-conforming students is well documented, empirical research regarding how non-traditional gender identity impacts on overall experiences of schooling has not been consistent. It is difficult to make comparisons between the experiences of students displaying non-traditional gender identities and expressions, especially across different school sectors, due to the fact that different school climates result in very mixed experiences for students. While research has indicated that students who vary from traditional gender norms are generally more likely to report a negative schooling experience, regardless of whether they attend a single-sex or co-educational school, recent research has emerged which suggests that some gender non-conforming and gender diverse students report positive experiences attending single-sex settings, particularly for girls attending American education institutions (Johnson & Gastic, 2014).

In particular, educational settings comprising all females are emerging within the literature as protective spaces for students presenting non-traditional gender identities and expressions. The progressive approach of all-girl environments towards gender diverse identities and expressions has been supported by several studies that have explored the growing visibility of gender diverse students who are attending women's colleges in the US context. The literature offers a range of reasons why gender diverse students favour these colleges. In a study conducted by Freitas (2017), transgender women attending women's colleges reported significantly more positive experiences compared to transgender women at co-educational institutions. There is also evidence of cases where transgender men (who were attending women's colleges when they began transitioning) have chosen to continue their education at their women's college, citing increased feelings of safety and support within this environment (Mencher, 2014).

While reasons and experiences of choice of single-sex college and schooling environments among gender diverse students is being increasingly explored in the US, the same attention has not yet been applied to single-sex education environments in the Australian context. The existing body

1 Media articles reporting on single-sex schools that have accepted gender diverse students have not been cited in order to ensure the privacy and wellbeing of gender diverse students.

of school choice research has predominately focused on understanding how class dynamics within Australia underpin parents' school choices (particularly parents' choice of schools within Australia's non-government school sector), without giving an extended consideration to the role that sex and gender may play in this process (Dumay & Dupriez, 2013; Alegre & Ferrer, 2010). However, as a significant proportion (approximately 12 per cent) of non-government schools in Australia are operating as single-sex schools, it has become increasingly important to question the role of gender and gender diversity in parents' choice of these schools for their children.

Despite literature which has made important inroads exploring the challenges of school climates on students' gendered subjectivities, no studies have explicitly examined how diverse gender identity and the heteronormative school climate interact to influence parents' perceptions and experiences of school choice. The growing acceptance of gender diverse students within single-sex schooling contexts could have a significant effect on families who aspire to this type of education, despite the fact that their child may not 'fit' with traditional expectations or policies of single-sex institutions. These schools may also be required to grapple with how to accommodate their changing student population. The recent emergence of gender diverse identities within single-sex environments therefore provides a significant opportunity to examine *why* parents of gender diverse children may opt for single-sex schools and *how* these schools (and the families who choose them) can cope with this new phenomenon.

The diversity of students' gender identities emerging within single-sex schooling environments provides the incentive for my PhD study exploring the experiences of parents who choose single-sex schools for their gender diverse children and how they perceive their choice of these environments as providing possibilities or limits for their child's gender identity and expression. Using qualitative interviews with parents of gender diverse students, my study aims to explore and compare how diverse gender identities are affecting the schooling experiences of different groups of parents who are seeking single-sex schools for their gender diverse children in Australia. Single-sex schools are at the vanguard of increasing societal, social and cultural acceptance of gender diverse children's rights. By investigating the experiences and needs of families of gender diverse children within single-sex school environments, I hope to produce a report of opportunities and recommendations that may provide further insight into ways to improve the school experience for this specific population (Russell & McGuire, 2008). ▲

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Life is not meant to be easy

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We see evidence all around us of the influence of the productivity agenda in education. It is no longer enough, if it ever was, to become a well-rounded liberal thinker, learned in the major disciplines, highly literate and well-read, an informed raconteur at a dinner party.

Education is a political and economic issue. It is about being competitive in the global world and being able to contribute to the global economy.

This then means, at school level, teachers focus on student learning, so students can achieve the highest possible OP or rank, so they can have a wider range of university options, and then — so the theory goes — have a successful life.

If only it was that simple.

All the evidence suggests that high achievement in a school's education system does not always translate to future career success.

Psychologist Shawn Achor, author of *The Happiness Advantage (2010),* tells us that only 25 per cent of job success is predicted by IQ; the other 75 per cent is predicted by one's optimism level, social support and ability to see stress as a challenge instead of a threat. If non-cognitive skills are much more predictive of students' longer-term success than test scores, surely it is time to redefine a school's contribution to the productivity agenda. Instead of being driven by PISA results, NAPLAN results, ATARS and OPS, what if the league tables published in the media focused on student wellbeing instead, given all the research that says happier people are much more productive people? This would be a much better measure of a young person's future contribution to the nation's productivity.

The Australian Gallup Student Poll, which is a 20-question survey that measures the hope, engagement and wellbeing of students from Years 5 to 12, could well be a good measure (Gallup Poll, 2018). Gallup's research has shown that hope, engagement and wellbeing are key factors that drive students' grades, achievement scores, retention and future employment. The current Australian results for wellbeing are of concern, with 39 per cent of 2018 students saying they are struggling, in other words, lacking positive thoughts and worrying about meeting the demands of daily life. This figure appears too impossibly high for a country like Australia. Of course, the underlying assumption of such a statement is that the external world is predictive of our happiness. Yet, the external world counts for only 10 per cent of our long-term happiness and success. Ninety per cent of happiness and success comes from the way our brain processes the world (Achor, 2010). It's not reality that shapes us, but the lens through which we view the world that shapes our reality. If that lens can be changed, then we can change (Lotto, 2017).

A focus on student wellbeing, as a measure of a school's success in graduating highly productive young people, not only reflects the research but also reinforces the view that Australia is not just an economy. It is a society, a community, in which we would like our young people to thrive.

There is no doubt that academic test scores are the easiest way to measure student progress, but they do not capture every skill needed in adulthood. If we want to identify good schools, we need to report on those skills which are developed by effective student wellbeing programmes and approaches, and are key determinants of positive adult outcomes.

No one expects everyone to be happy every day of their life; there will be inevitable sadness and disappointment. However, happiness is about being, on balance, positive and optimistic. Research on happiness will tell you it can boost productivity by anywhere from 12 to 31 per cent, depending on the study. It would be no surprise why. Positive emotions can help you feel more energised and

invigorated; happy people are more co-operative and have better social relationships; and positive emotions translate into greater persistence at tasks and better cognitive functioning (Achor, 2010).

Currently, parents and educators work hard to keep their children positive and optimistic. Much more so than in the past. We often take the line of least resistance. Rather than teaching the necessary skills, we just make it tremendously easy for them. This is a mistake.

Reading the work of Australian social commentators, Michael McQueen (2018) and Claire Madden (2017), will reveal some interesting facts about our current generation:

- Sixty per cent of young people want praise at work every day. This could simply be praise for just turning up.
- Young people fundamentally believe that life was not meant to be hard.

This is very different to those of us who remember former prime minister Malcolm Fraser telling us that 'life wasn't meant to be easy'. Popular culture and advertising tell young people the opposite to this. As adults in their lives, we have spent a huge amount of time removing anything negative in the pathway of our young people, because we want our children to feel good about themselves. Yet, the same media only reports the negative — every headline, every news report focuses on the negative; even social media provides a very skewed view of the world. On social media other people's lives look effortless and special because we are only seeing what Michael McQueen (2018) refers to as their 'highlight reel' rather than the mediocre, behind scenes lives we all have. The average 14-year-old has 10,000 words in their vocabulary compared to the average 14-year-old in 1952 who had 25,000 words (McQueen, 2018). In fact, 50 per cent of 8 to 18-year-olds would rather talk online than in real life. How are they going to effectively communicate the complexities of their feelings and emotions, when things get a little tough?

This is also the generation who would rather lose a pinky finger than their mobile phone (McQueen 2018). However, it is important to note that one of the drivers of young people's great interest in social media is the need for 'likes' and comments and their dependence on praise (Madden 2017). They also know that to maximise the highest possible number of 'likes', one must post on Instagram between 5.30 and 6.30 pm or between 7.30 and 8.00 pm Young people continually look to the external for happiness, yet the secret is that it must come from within, and requires certain skills and outlook.

Therefore, it is time that we, the adults in their lives, stopped trying to make our young people happy; rather, it is our job to show them how to learn to make themselves happy. There is a distinction. We need to equip them with the skills and outlook to choose to do that. That is key for a successful school experience and ultimately for a productive and successful life.

Make no mistake, what I am advocating is hard, but adults need to stop turning themselves inside out to pave a smooth path for our young people. This only feeds their view that life was meant to be easy. If life gets hard, they think there must be something wrong with their choice, so rather than persist, they pull out when things get tough. Or worse, they think something must be wrong with them. Gen Z thinks hard equals wrong (MacQueen, 2018). They don't buckle down and get on with it. We all created this problem after 1979, the United Nations Year of the Child, when the self-esteem movement took hold. You will recall that prior to that children were meant to be seen and not heard. Now, their needs and wants rule the household.

Perhaps it is time to advocate for the Year of the Adult. I fear their extinction. In fact, the World Health Organisation has now extended the adolescent age group from 12 years into the early 30s. In our culture there is a widening gap between biological maturity and social transitions to adulthood.

This generation craves leadership and boundaries. They tend to dismiss most adults, letting them know 'I've got this' (MacQueen, 2018). They give the impression they don't need our guidance because we don't really understand their social media world, and all its rules and mores. There is a brash arrogance about them, but it is a façade. They need us to impart the wisdom that comes from experience and share our life lessons all the way until they are in their 30s — perhaps even beyond. We should not be lulled into thinking otherwise. This does not mean, however, that we should do their work for them.

Most parents want their child to be happy, and to be a productive member of society. They want them to access a university course of their choice, secure a job, and have a career in a specific field. Yet, the world of work for this generation will be vastly different from the one we have now. The signs are already there. No one wants to work for or with anyone anymore; they want to work from home, they want to be entrepreneurs, bid for jobs online — it is too hard to work with others and to go to work each day. Little wonder when current 18-year-olds display 40 per cent less empathy than 18-year-olds did 20 years ago (McQueen, 2018). This is an issue, particularly because having empathy is likely to be a key discriminator for future success.

Familiar to many, are the skills required in the workforce of the future, as produced by the World Economic Forum:

- Complex problem solving
- Critical thinking
- Creativity
- People management
- Coordinating with others
- Emotional Intelligence
- Judgment and decision making
- Service orientation
- Negotiation
- Cognitive flexibility

Empathy is fundamental to these skills.

A focus on these skills will prepare our students for a non-linear career progression post school. It is important to note that most of them are not, and cannot be, measured by national testing. Few can be developed by making life easy. The notion of career planning is well and truly dead for this generation. This is because it is impossible to plan for non-linear career progression; parents want a clear path, but for our students the future is vague and unclear. We need to teach empathy, and find many varied ways, through both the extra-curricular and classroom programmes, to develop 21st century employability skills.

A successful school is one where graduating Year 12s have the ability to make themselves happy. They are prepared to look at life through a positive and optimistic lens. To ensure this, though, we need to stop the discourse about results and university courses, which is focused on competition and stress. There needs to be a focus on just always doing the best one can, and much imparting of the wisdom borne of experience from teachers and parents.

Malcolm Fraser actually paraphrased his quote from George Bernard Shaw's play *Back to Methuselah.* It is much more helpful in its entirety, which reads:

> "Life is not meant to be easy, my child; but take courage: it can be delightful."

This is the message we need to get across to our young people and Australia's productivity agenda will be met, and perhaps exceeded. ▲

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Young people continually look to the external for happiness, yet the secret is that it must come from within, and requires certain skills and outlook.

Empowering girls to keep showing up: Building resilience in the middle years

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Phyllis Fagell of the *Washington Post* asserted in 2017 in her article 'Want to raise empowered women? We need to start in Middle School' that schools must teach specifically targeted wellbeing programmes in adolescence if they are to raise resilient young women.

Contemporary educational thinking champions the idea that girls need to be resilient to what life can, and will, throw at them. In a rapidly changing landscape, the world our young women will enter as adults is simply not the same one, we adults navigated as youths. To flourish in this new world, girls need a gritty kind of resilience born out of consistent messages at key developmental stages, as well as explicit educational frameworks that will both buffer and rebound them as they face inevitable challenges.

To raise and educate resilient young women is no mean feat. Resilience — defined as the ability to persevere through setbacks — allows girls to take on challenges and risk making mistakes to reach goals, and is the bedrock of qualities such as grit, courage, empathy, optimism and self-efficacy. In a world where a state of happiness is so coveted, we educators constantly strive to develop wellbeing programmes that will encourage young women to discover and be accepting of their authentic selves. Perhaps more importantly, young women need the confidence and courage to embrace the inevitable setbacks they will face.

In a speech on International Women's Day in 1997, Hillary Clinton explained that that the ability to recover from life's setbacks is the ultimate skill girls today need to be taught. She admitted that she is buoyed by the courage, stubbornness and optimism inherent in girls who have bravely faced obstacles and overcome their fears. Specifically, Clinton contended that it is indeed these setbacks that are the making of courage and optimism in happy, healthy adults:

> It is easy to be grateful when things are going our way. But to exercise the mental discipline to be grateful in the face of setbacks, I have found, is one of the great experiences that gives you that resilience and the opportunity to see your life, to see your community and the world much more broadly, and to keep going. [It's] the inner strength, even the stubbornness to keep showing up every day, to refuse to quit or give up in the face of any setback.
>
> In essence: the message here is that we must to teach our girls to face adversity, failure and setbacks in order to nurture wisdom, courage, and character; that when things go wrong, they must continue to 'show up'.

At Strathcona, our *Feliciter Wellbeing* programmes in middle school have at their heart, the notion that to build resilience; emotionally, digitally and intellectually; we need to teach these skills explicitly in every facet of the learning lives of the girls. Designed to allow the girls opportunities to acquire the skills of recognising their innate and learnt strengths and weaknesses, our wellbeing programmes equip girls with the skills required to build resilience. Positive education philosophy is integrated into Strathcona's wellbeing programmes, particularly in the middle school, Years 7 and 8, with a focus on mindfulness, gratitude and affirmation. We teach the thinking skills of being realistic, rational, and empathetic, and to look on the bright side of difficult or disappointing situations, that our girls will inevitably encounter. Similarly, our academic pedagogy is based on Stanford University's Professor of Developmental Psychology, Carol Dwek's philosophy of growth mind sets; the idea that we can grow our brain's capacity to learn. Academic feedback at Strathcona focuses on learning. Allowing mistakes in learning is encouraged as a learning strategy, as is acknowledging and rewarding endeavour and adaptable learning routines. Teachers

constantly evolve teaching practices to enable girls to develop fearless confidence in facing any new academic challenge. As mounting research reveals, the relationship between improved outcomes in academic performance and high degrees of emotional intelligence is unquestionable. Yet, the breadth and depth of adolescent depression and anxiety in schools during the middle years is a continuing concern and appears to affect young people in all demographic and international spheres. In 2017, Strathcona partnered with Swinburne University to introduce *Aristotle EI* that aims to explicitly teach skills of emotional intelligence in the middle years. These sessions give the girls opportunities to learn and practise important values and skills that will build resilience. *Aristotle EI* is designed to implement evidenced based strategies that enable girls to build their emotional intelligence abilities, and will be fully integrated into the wellbeing programmes at other year levels in future.

Middle school girls who feel like they belong to their school community, and have a place in a social group, will be more invested in their learning and have greater levels of self-acceptance and resilience. While feeling a part of a wider community, and discovering a place to contribute in some way, can create a greater sense of self-worth and place in the world, it is evident that schools today provide the only real community for many families. *Feliciter Wellbeing* cross age programmes and newly implemented vertical House pastoral system allow for meaningful interaction between the different year levels in senior school and provide opportunities for girls to see and make connections in different year levels. House pastoral programmes are designed to engage and facilitate new friendships and connections among the girls and there is a clear framework of support for negotiating the different stages of adolescence through specifically designed mentoring. The skills of making friends, solving conflict and building self-awareness in relationships involve full immersion days, where the girls are given a repertoire of clear strategies of social resilience. Any teacher at a girls' school can testify to how important forming and maintaining new friendships are, and how this can have an overwhelming impact on a girl's sense of self. Empathy, social awareness and inclusiveness are areas of focus in our middle school wellbeing programmes that seek to empower the girls to make well considered social choices within their friendships.

Born into a world of ubiquitous digital multimodal immersion, there is no question that our students today are the native speakers, constantly dashing ahead of us to discover new frontiers, where we, as parents

and educators, will only ever be newly arrived settlers, struggling to adapt to this new language. Their world is simply not the world we grew up with in the 1970s and 80s. Even the most digitally savvy of us cannot compete with the adaptations our children's brains have made since birth, to establish and nurture innovative neurological pathways in a digital world. This will, perhaps, be the greatest chasm between two generations' experience of the world since the advent of electricity. For most brave parents, learning how to keep up with technology is exhausting in an ever-changing landscape. We are never fast enough with the remote, with our texting and phone use, up to date enough with the latest shortcut or abbreviation. There are few parents who do not know the exasperated look and subsequent snatch of a device by a child when we are judged as being too slow — which usually occurs when we think we know some new tricks: how to swipe left, swipe up, hit home screen twice, use a short cut, inbox, DM, switch screens — it can be bewildering at best, and tantrum inducing at worst (and that's just for parents)!

Technology that can maximise students' engagement and connectivity in research and learning is incredibly exciting in our girls' lives, yet it can leave us adults isolated. We, as educators, have no option other than to keep learning, upskilling and staying present in this new world, if we want to help provide crucial ethical education on digital literacy. Parents are doing their best to keep up, but schools have a compelling need to teach online ethics in wellbeing programmes — it is not enough anymore to simply ban the internet or device. Middle school teenagers interact with a worldwide community countless times a day, in and out of the classroom, in transit and at home. Instead of existing in the local and school community, they live in a world of literal live streaming of digitally enhanced images and videos at any moment in the day, and often night. It is necessary, then, that we explicitly teach the practical and ethical skills of how to deal with this at school. At Strathcona, the management of digital media devices is taught through constantly evolving, graduated levels of learning and there is a rigorous digital citizenship programme tailored for every development level. Teaching these digital skills is underpinned with the emotional resilience to counteract unwelcome content. Learning how to block content, interact appropriately, and filter and manage privacy settings on their devices allows our girls to interact with this part of their world with confidence and safety.

As parents and educators, we want nothing more than to see our middle school girls flourish and embrace the opportunities that this new world offers them. At Strathcona, we continue to ensure that these skills are key parts of the DNA of all our teaching and wellbeing pedagogy, so that our girls can navigate their world with a gritty, agile resilience, and continue to thrive as they journey into adulthood, and hopefully, keep turning up. ▲

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Balancing need: Responding to student mental health needs, teacher workload and privacy concerns

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Schools are required to respond to the sometimes complex, changing mental health needs of students. These may be short or long term in nature, established or emerging. Changes in student needs may come as the result of intervention, variation in circumstances, the implementation of new strategies, or the evolving impact of a chronic condition on the student and those around them.

According to the Australian Bureau of Statistics (2019), 21.3 per cent, just above one in five males, between 15 and 24 years of age have a reported mental or behavioural condition. The number for females between 15 and 24 years is higher at 30 per cent, or close to one in three. This confirms the importance of this area of critical need for those working with young people, and particularly young women in secondary schools.

In order to respond effectively, relevant and timely information is needed by those working with the students and their family. This information needs to sit within the already crowded teacher workload, where there are competing demands on time and focus. With increases in the incidence of mental health needs, there is a significant amount of detail for teachers to retain and information for schools to manage.

Students should be able to access support when needed, in a manner that responds to their circumstances and concerns. Particularly in a secondary school environment, young adults increasingly need to be partners in design and planning, as well as implementation and use of support services.

Privacy requirements of the student and their family also need to be considered. This is particularly important when working with heightened concerns of families regarding later-in-life discrimination, or with families and students in need and sometimes in crisis. At times there are also legacy issues from the challenges faced by the student and family through childhood — all of which elevates the need for generating and deserving trust in school systems.

Our response has been to develop, pilot, implement and review a three-tier system of support plans. These exist and are managed in conjunction with an online student management system. This digital aspect of the work is important as it provides a method for sharing changing information in a controlled manner.

The foundations for these support plans are based on partnership, external professional support, and regular review. A support plan results from a meeting involving parents or guardians, the student and external care providers, in conversation with a College Counsellor and Guidance Coordinator and other College representatives as required.

Partnership: The plan is initially developed with the student, Guidance Coordinator and College Counsellor working together. This group identifies:

- times or situations where need arises,
- what the teacher is likely to see, and
- what the best-fit strategy would be in response.

With a focus on developing skills in resilience and self-care, initial strategies for a tier one support plan include those that allow the student to remain in class and supervised. They create an opportunity for the student to focus on the strategies that have been developed, including breathing techniques, drawing or writing strategies, or in some cases computer-based modules.

A tier two support plan responds to greater need. The student still initially employs in-class strategies, but where these strategies do not provide enough intervention, the student is given permission to meet with the College Counsellor for assistance. The student is then required to return to class. If that is not possible, a parent or guardian is contacted. The plan is only enacted once it has been shared and understood, and approved by family and an external care provider.

A tier three support plan provides the highest level of support. This level plan is implemented when a student is returning from hospitalisation as a result of self-harm,

or where the College risk assessment indicates that close support is needed. These tend to be short-term measures, with the risk quickly diminishing, often with intensive external support, or the student being placed in a facility designed to meet their needs. When creating a tier three support plan, the College is explicit in identifying that it has no available measures to closely supervise a student all day. Movement to and from class, recess and lunch must be able to be safely managed by the student before a tier three support plan is adopted.

External professional support: A first tier support plan involves in-class strategies. For this support plan, the family and College Counsellor work together without the mandated requirement of an external care provider. Second and third tier support plans mandate the involvement of an external support provider due to the nature and greater degree of need, recognising that the student and family require ongoing support. To this end, relying only on the structure of the school in the student's life, or the 'triage' support of the College Counsellor, does not provide sufficient support for students and their families. External health professionals provide primary care, work with other family members and, crucially, provide consistent care throughout the year, regardless of term dates. Where support plans are developed within the College, in many cases the external support team has made initial recommendations. In addition, for tier two or three support plans, approval from the external team, as well as parents or guardians, is necessary.

Regular review: Support plans are reviewed each term by the Guidance Coordinator and student, and at times the College Counsellor. Any changes are approved by external professional support as well as parents or guardians. This process allows the student to be in a position of partnership and have some control. It also signals to the student that their current need does not create a permanent label, and that the College is interested in their growth or ongoing experience. This part of the process also reinforces to the family that the College is open to an evolving conversation as needs change.

The structure of the system and support plans have alleviated teachers' concerns about needing to remember numerous details for multiple students. As American civil rights activist Rosa Parks said, "knowing what must be done does away with fear".

Management of need

Key strengths of the system are ease of access and currency of information for classroom teachers. A teacher-only online platform displays icons that immediately signal the general approach needed. A green leaf indicates a tier one support plan with in-class strategies. A yellow leaf indicates a tier two support plan and pre-approval for the student to leave class to meet with the College Counsellor. A red leaf indicates a tier three support plan in response to critical need. When time allows, for example at the start of the term or when informed of a new plan, teachers are able to investigate further and read the full support plan which sits deeper within the online platform — here teachers will find more detailed information and specific strategies.

With this approach, teachers know that information is readily available, with the icon allowing a quick and discreet visual cue should a situation arise in class or during another school activity.

The structure of the system and support plans have alleviated teachers' concerns about needing to remember numerous details for multiple students. As American civil rights activist Rosa Parks said, "knowing what must be done does away with fear". The fear around how to respond and manage increased need has been, to a significant extent, reduced for teachers through the structure of these support plans.

Management of privacy

A strength of the support plan in terms of privacy is that the circumstances faced by a student are communicated to a small team of staff, limiting disclosure of private information. This has contributed to open discussions with families and students, and has assisted with the important work of generating trust. External teams providing support have been agreeable to working with the structure of the support plans and adjusting recommendations in conversation with the College Counsellor if needed.

The support plan focuses on outlining what the teacher might see as an expression of need and providing appropriate strategies in response. The support plan provides enough information to allow the teacher to be trusted as a professional to provide required care strategies, without overloading the teacher with unnecessary information, and without having the student feel exposed. As an online document there is no concern about version control. When a new support plan is adopted, staff are informed via email.

Experience of support plans

Through a period of review teaching staff highlighted the strengths of the system in terms of accessing information. Language included “highly effective”, “really useful” and “valuable form of communication”. Changes to the visual presentation were made based on feedback about the file format, and the process of communicating changes was also streamlined. While it was identified that there is a lot of information available for teachers, the use of icons on the student management system is seen as an initial layer of valuable information for teachers as they connect with their classes.

In terms of student experience, it has been surprising that many of those who are supported through a tier two support plan ultimately do not need to access the College Counsellor during class. Anecdotally, the conversations that took place and the provision of strategies that were agreed upon with the implementation of external support, led to a greater sense of control for the student and a sense of being able to manage. Where appropriate, students have moved from a tier two support plan to a tier one support plan, or have decided to conclude their access to this program. This feeling of being in control of the process, with support along the way, has been a positive aspect of the system.

Ultimately this is an area of critical need requiring flexible and thoughtful action that is able to balance multiple needs. The importance of finding structural solutions for teachers, school communities, families and always the young women in our care must not be forgotten amidst the busyness of school life. ▲

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Mission to Mars: An interdisciplinary approach to teaching and learning for gifted students

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At The Mac.Robertson Girls' High School we work in an environment of highly-able students and teachers where disciplines are fairly defined and their disciples passionate. In our community, the complex ways of thinking, doing, and learning in each discipline are highly valued and the thoughtful, exclusive knowledge-building that each discipline supports is encouraged. We are living in a dynamic and uncertain global landscape.

However, we understand and are moving towards a greater appreciation of the occasional limitations of defined disciplines, by allowing for deeper understanding that cross-pollinates or connects apparently unassociated ideas or concepts in new ways (Stevens, 2014). In recent years we began to ponder how to turn this understanding into an opportunity for enquiry and to create a purposeful environment of combining and recombining ideas for our school community: thus, in 2017, our Year 9 interdisciplinary programme was born. Affectionately known as 'Mac.Rob's Mission to Mars', students work in teams of 25 to answer the central, far-reaching question: *what does a successful colony on Mars look like?*

A modern definition of giftedness accepts the complex and abstract nature of the concept, and we have this complexity at the forefront of our programme planning. Giftedness is reflective of societal values; is domain-specific (and gifted individuals can in turn revolutionise domains); can be demonstrated through measurable and exceptional achievement (though does not necessarily lead to achievement); and is influenced by multiple environmental, social, and biological factors (including gender) (Dai, 2010; Gagné, 2008; Subotnik, Olszewski-Kubilius, & Worrell, 2012). Gifted boys and girls are similar in their intellectual abilities, creativity, and psycho-social development, and it seems that societal differences in the messages given to girls and boys are the key factors leading to the disparities in achievement in the highest career echelons (Kerr, Vuyk, & Rea, 2012). By adolescence, it has been reported that gifted girls have often begun to seek opportunities to develop their abilities (for example, by joining online communities or participating in extracurricular activities and competitions); but, external pressures (such as popularity concerns and the power of media messages promoting physical attributes over intellectual pursuits) begin to affect whether and how girls pursue their interests (Kerr, 1994; Kerr et al., 2012). We aim to provide opportunities through the programme that connect to our students' ambitions, passions, and interests, while creating an environment for learning that perhaps subverts traditional expectations of what academic or educational success may look like.

Our school's questions and discussions that led to the programme were therefore focused on how we can best serve our gifted cohort, and also on how we could support teachers in the same exploratory and risk-taking behaviours in their own practice. These wonderings are

echoed in learning environments across the globe. Part of The United Nations Declaration of Human Rights states that 'inclusive quality education' is fundamental to improving development outcomes, be it social, economic or environmental (United Nations Educational, Scientific and Cultural Organisation [UNESCO], 2009). McKinsey & Company encapsulates this notion in their report on the world's best performing school systems, stating that 'the quality of the outcomes for any school system is essentially the sum of the quality of the instruction that teachers deliver' (Barber & Mourshed, 2007, p. 29). Inclusive quality education relies on the creation of an *effective* teaching and learning environment and teachers must be supported in creating such an environment to the benefit of individual students. The importance of quality instruction is a consistent message in the literature on educational effectiveness and school improvement: building leadership and teaching expertise and structuring teaching to ensure all students succeed (Zbar, Kimber, & Marshall, 2008); organisation of the learning environment, quality instruction and rigorous and aligned curriculum (Rutledge, Cohen-Vogel, & Osborne-Lampkin, 2012); and coaching, mentoring and sharing expertise, and raising staff expectations of students (Department of Education and Early Childhood Development [DEECD], 2009).

Three of Edmonds' five 'correlates' for measuring school effectiveness could be grouped under the broad umbrella of 'teaching and learning': an emphasis upon basic skill acquisition, high expectations of what students would achieve, and frequent monitoring of the progress of students (as cited in Reynolds et. al., 2014). These correlates point to the significant role of the teacher and the strategies used to enhance the learning experience of all students. This notion is supported by Hattie (2003) who found that three of the most powerful influences on student learning all stem from the teacher: feedback (effect size 1.13), instructional quality (1.00), and direct instruction (0.82). The Grattan Institute found that 'effective teaching with teachers learning from each other' is an integral step to school 'turnaround', with two of their five steps to improve schools falling under the umbrella of teaching and learning (Jensen, Hunter, Sonnemann & Cooper, 2014, p. 6). In a way, the use of the aforementioned resources as a tool for learning and collaboration affirms this research. The McKinsey report into the top performing school systems found it is necessary to improve the quality of instruction, before any improvements in student learning can be made. One of their key findings showed that 'students placed with high performing teachers will progress three times as fast as those placed with low performing teachers' (Barber & Mourshed, 2007, p. 15). Finally, Hattie (2003, p. 4) suggested 'that we should focus on the greatest source of variance that can make the difference — the teacher. We need to ensure that this greatest influence is optimised to have powerful and sensationally positive effects on the learner[s]'.

So, our core question and ongoing objective became: how might we provide and nurture opportunities for optimising teacher creativity and exploration, sharing best teaching practice, and providing future-focused interdisciplinary learning for our highly-able and gifted cohort? While beginning by acknowledging that teaching creatively and ensuring students are given opportunities to learn creatively are two different challenges (Jeffrey & Craft, 2004), we also accept that the definition of creativity itself is as abstract as giftedness, at times a 'we will know it when we see it' situation. History can pinpoint creative thinkers who revolutionised their respective domains (for example, Curie, Tesla, Einstein), but society lauds their achievements (i.e. the products of their giftedness) much more often than discussing their learning journeys, or the impetuses behind their creativity. Mac.Rob's Mission to Mars is an exemplar in exploring these creative stimuli and changing teaching and learning culture. We created this mission around the 'new survival skills — effective communication, curiosity, and critical-thinking' (Zhao, 2012, p. 8). Through this programme we hope students develop an entrepreneurial mindset of risk taking, curiosity and creativity (Zhao, 2012). This year we are continuing to use the programme as a springboard for piloting teaching and learning innovations, and to demonstrate best practice principles to build capacity in both our graduate and experienced teaching community. We focus on how to develop self-efficacy and adaptive motivation in the classroom, and design for collaborative learning, multiple exposures, and metacognition during each event, and across the programme, practices which are now becoming integrated into more classrooms across the school.

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In developing and implementing the programme we have drawn on design thinking principles and focused on metacognition and character strengths as integral to the programme. It is distinctive in that many similar programmes focus solely on STEM; while our programme certainly incorporates STEM elements, we focus on multi- and inter-disciplinary approaches that allow our students

to both apply knowledge from different disciplines, and build the enterprise and transferable skills required for a 'New Work Reality' (The Foundation for Young Australians, 2019). To support our teachers, we consult and liaise with teacher contributors and external experts, provide professional development to enhance skills in innovative teaching and learning, track curriculum connections and opportunities, and ensure that the teaching and learning approaches allow for student agency, autonomy, and leadership. This has directly led to increased discussion around the importance of an interdisciplinary (possibly moving towards transdisciplinary) approach to education in our dynamic and changing global landscape, and how innovations enhancing gifted girls' education can be visible, shared, and built into our planning and implementation of learning/ teaching programmes and curriculum design.

All the above are considered within the normal challenges of a school environment. Time, opportunity, and an open and collaborative environment are integral to the implementation and success of the programme, and we continue our attempts to integrate the processes that have enhanced and extended student learning more widely into our curriculum design, while investigating the conditions that best support such learning. Inevitably, we return again and again to the same conclusion; nurturing the creativity and best practice of our teachers, the disciples of their disciplines and learning guides, is the essential key to observing similar positive outcomes in our students' learning journeys throughout Mac.Rob's Mission to Mars programme. ▲

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Brain Club: Holding space for deep learning through conversation

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As educators of young women, we are in the business of encouraging self-direction, resilience, curiosity and creativity so students can understand their identities, build their cultural capital, and learn how to make an impact on the world. Brain Club is a 'beyond curriculum' activity that provides an opportunity for rich conversations that challenge the boundaries of thinking and the way we have been socialised. Furthermore, it impacts our engagement with the world and how students can influence the lived experience and perspectives of their peers, through sharing within the school community, and hopefully back at the dinner table. An individual's ever-growing cultural capital is a collection of knowledge and skills that can be accessed to recognise and understand various socio-cultural phenomena, historical patterns, motivations and ideologies, and enable an appropriate response to contemporary issues and events.

The development of this capital is important for young people so they can make sense of what it is to be human. Many of these skills are touched on within the curriculum; however, time and perception constraints can limit a student's deep engagement in learning for learning's sake. Also, in a world of social media, where people express their inner workings to complete strangers, and put themselves in a vulnerable position with little recourse, young adult learners need opportunities for real conversation so they can expand their cultural capital and be prepared to challenge narrow-focused perspectives.

Deep learning beyond the curriculum

Brain Clubbers grapple with complex ideas and have delved into notions of identity, deviance, ethics, culture, and truth-telling, while also sitting with the discomfort of not yet knowing enough to feel completely safe in sharing their ideas. Some topics from Brain Club in 2018 included: challenges of identity, cultural appropriation versus appreciation, villains, taboo, existentialism, women in leadership, compassion for all animals — pet vs food, perceptions of mastery, dumbing down the media, uncovering the myth of non-violent leadership, and other issues that challenge young people today. Inquiry and conversations around these types of topics allow for deep learning to occur through higher order skills such as analysis, critical thinking, evaluation, reflection and metacognition. Students can build their capacity to deepen their knowledge and develop opinions, but "deep learning doesn't happen by accident…[it] needs to be deliberately supported, cultivated and encouraged by educators and educational settings; that is, we must teach for deep learning" (The University of Queensland, 2017).

Climbing into the pit

Students need to be pushed to a point of discomfort in their learning so they can build resilience because playing it safe does not lead to learning growth. James Nottingham's (2017) "The Learning Challenge" explores how students move through cognitive stages as they challenge their own thinking and seek effective learning habits to move their learning forward. Embedding struggle is integral to the feeling of success. We want to encourage students to climb into the 'pit' to be challenged, so they can practise those new

IMAGE: BRAIN CLUB PARTICIPANT, PENNY, CHALLENGING THE COMMUNITY THROUGH SHARING HER THOUGHTS ON EXISTENTIALISM, FAITH AND "NOTHING" AT THE MMC VISIONS SHOWCASE IN 2018

learning habits that can get themselves out. As educators, we need to be creative, seek challenge, reflect on our classroom practice, and share ideas with peers so they can be inspired to be the next generation of thinkers and leaders. The layers of cognitive progress evident in Nottingham's learning challenge work have multiple applications. Not least is allowing teachers to feel safe in risk-taking, as well as providing a structure for some rigorous meta-cognitive reflections, to enable students to believe they can get to their "eureka" moment rather than skimming the surface. This is when real deep learning happens.

Questioning to deepen the conversation

Teachers and Brain Club coaches can challenge students to seek deep learning through effective questioning and collaborative thinking. Social construction of knowledge happens when we interact with peers so we can see our own perceptions, assumptions and values in relation to others (King, 1995). Ritchhart, Church and Morrison (2011) and Project Zero (2016) have strategies on making thinking visible through questioning and thinking routines. Using thinking routines in the classroom and Brain Club, particularly around metacognition and peer discussion of ideas, helps students to organise theories and thinking, and to seek next steps for complexity. Understanding how they are thinking can help if they are 'stuck' in the shallows. Thinking routines, such as 'Speed Dating', concept mapping, question routines or 'see-think-wonder' also give the teacher confidence to take a risk and let the ideas flow, rather than trying to control and plan the "conversations" to the end. Speed Dating is peer sharing rounds under time constraints, where each person is holding space and attention for the other to share thinking, and in return enable them to give meaningful feedback. This process has multiple benefits, including clarification of ideas, practise articulating an argument or perspective, and embracing the collective responsibility to support the whole group in deepening their thinking through challenging surface level ideas. Often the best work from our students comes when they are "poked" with questions to extend their thinking within engaged conversations had in real time, human to human.

Curiosity and thinking about learning

Brain Club can be a forum for students to find their love of complex thinking. Intrinsic motivation to engage curiosity can push learning further because students desire to know more about their topic. When students are motivated to know more, their learning becomes a joy rather than a chore. Complexity is key – when students desire to dig down into the layers of understanding they find their own space for meaningful learning to occur. Furthermore, they benefit from thinking about their thinking. Students must be realistically aware of their own cognitive resources and learning processes, and how they can control them. Biggs as cited in Jensen (2016) calls this 'meta-learning'. Questions they might ask to deepen thinking include: What kind of thinking am I doing while I sit in conversation on this topic? What is going on in my head? What bias am I bringing to the table? How automatic is my response to that idea? How might I lean into the resistance I feel because I am challenged by that concept? According to King (1995), "formulating questions (even if not answered) is an act of critical thinking". Students could employ statements such as "I used to think..., and now I think...", and strategies that result in "verbal tug-of-war with questions" (Jensen, 2016). Therefore, supporting students through meta-cognition and questioning can influence their engagement and motivation to tap into curiosity for deeper learning.

Risk and vulnerability are desirable

Leading this activity means taking risks to not hold on too tightly to preconceived ideas of where the learning is going. One must take the time to just be present while students dip their toes into topics and grapple with their fixed ideas. Vulnerability invites change; it can be a powerful gift for someone to be open and willing to challenge their own thinking. Today's students are consuming information at high rates due to social media and insta-fame. Brain Club is more about long, slow, deep conversations over time, that allow for rich engagement and real human connections. It allows for empathy by diving into the perspectives of others, so we can listen and hold space for new ways of knowing our world. "The mutual respect and understanding each of us has for every individual human experience is something very special" (Penny, Year 12 in 2018).

Young women digging deep: Voices, identity and neuro-diversity

So, what are young women talking about? In 2019, our rich conversations are engaging students with the idea of how young Australian women of all ethnicities can have a voice within their own contexts and contribute to the diverse fabric of the community. For example three of our students, Isabella, Aneeljot and Gurnoor, are sharing this through their lens of new arrival, immigrant and second generation Australian, and how their experiences sit alongside their peers, who are part of the dominant culture. Their conversation is about what they see and hear from young women around them, while they openly consider their own life paths and how they choose to use their voices. These different lenses are impactful when shared with the College community and provide a tangible means for real empathy and appreciation for privilege. Other opportunities for sharing stories and seeking to impact the community are currently coming from students with trans-national identities who are grappling with what it is to be "a young Australian woman" and how the treatment of Indigenous people, refugees, asylum seekers and immigrants throughout Australian history has not supported their sense of justice. They show great resilience and maturity in discussing and evaluating how much change in Australian society is possible. Finally, think about how great it would be to engage one of your neuro-diverse students in helping the neuro-typicals to understand a different way of seeing the world. Consider the impacts this could have on the immediate school community and future workplaces.

So, what are young women talking about? In 2019, our rich conversations are engaging students with the idea of how young Australian women of all ethnicities can have a voice within their own contexts and contribute to the diverse fabric of the community.

Through Brain Club, students find their sphere of influence expanding and they are exposed to more ways of thinking. Therefore, seeking ways of extending student engagement with complex, contemporary issues and ideas beyond the curriculum can add a rich layer to their high school experience. ▲

Brain Club is a 'beyond curriculum' activity that runs fortnightly for two hours after school. This registered TedEd Club connects with other clubs globally, and shares impact projects locally within the College and at an annual showcase event. Impact projects have included assembly speeches, campaigns, open letters, videos, slam poetry, app pitches and infographics. The first rule of Brain Club is: there are no rules.

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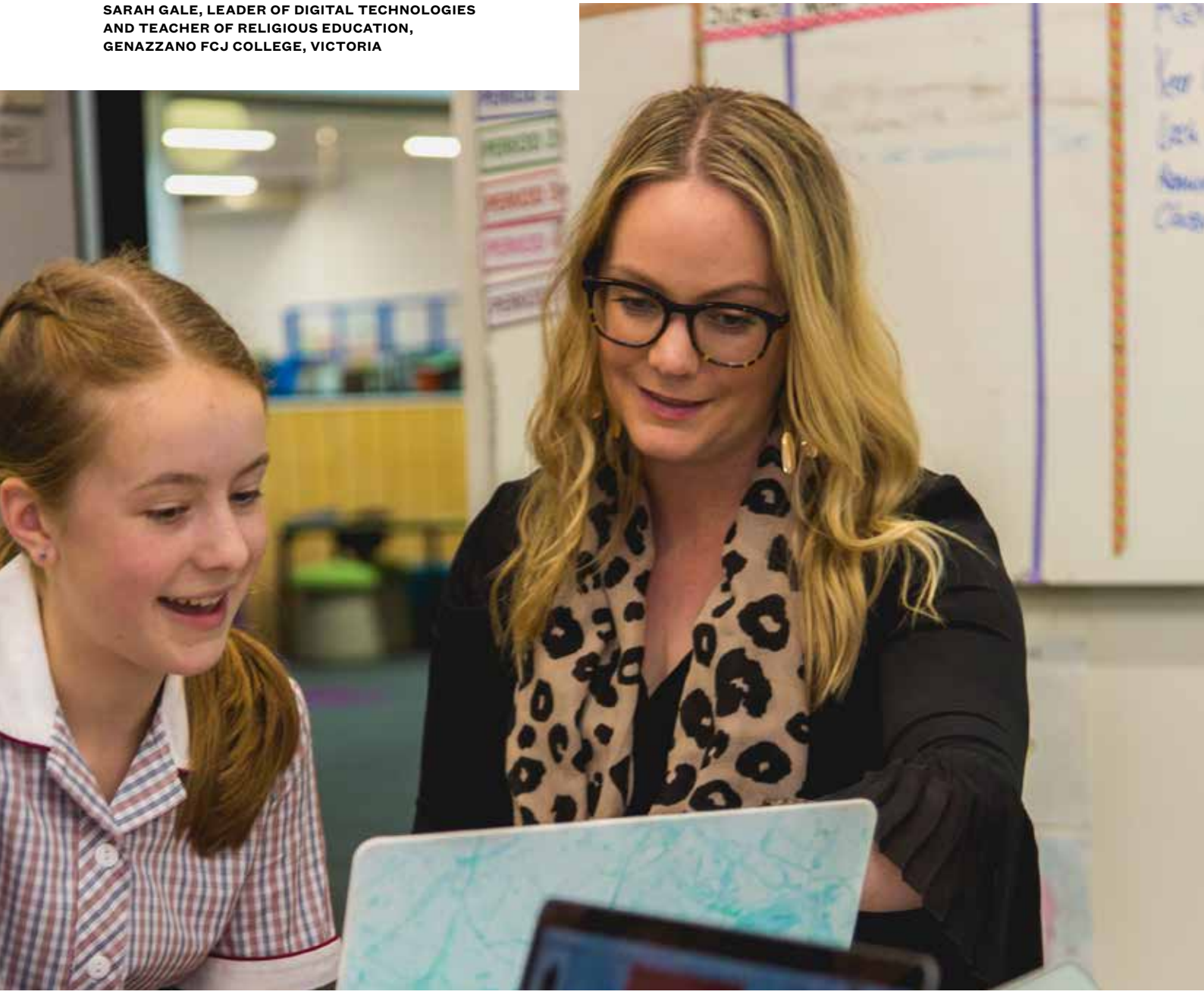
An innovative app prototyping project: Integrating Digital Technologies and Religious Education

SARAH GALE, LEADER OF DIGITAL TECHNOLOGIES AND TEACHER OF RELIGIOUS EDUCATION, GENAZZANO FCJ COLLEGE, VICTORIA



Year 7 is an exciting time for our students and the perfect opportunity to introduce innovative practice to inspire inquiring minds. An App Prototyping Project was designed to bring together student learning in Religious Education (RE) and in Digital Technologies, particularly the way students presented their learning. It incorporated aspects of the Digital Technologies curriculum within Religious Education classes, which were focused on connectedness to school community.

When students begin at the College, we want them to feel a sense of belonging and to understand our history. Through learning about the Sisters Faithful Companions of Jesus (FCJ), who founded the College, and the foundress of the Sisters FCJ, Marie Madeleine d'Houët, students can begin to feel a sense of belonging to the faith-filled community that is Genazzano FCJ College. The students immersed themselves in the history of the Sisters and rummaged through the archives in order to bring to life an app prototype that demonstrated their learning in this unit.

Aims of the project

The App Prototyping Project aimed to meet one of the intended outcomes of the College's Annual Action Plan: that students are active participants in an engaging Religious Education curriculum. With the integration of the Digital Technologies curriculum, I hoped to enhance student engagement in Religious Education to support the overall goals of the College. It was also an opportunity to gain valuable data from our students about the idea of connectedness and belonging to a faith community, as well as the growth that students showed through using technology and prototyping.

The overarching question then became clear: If the students are provided with a rigorous assessment task, how will this impact on their engagement in Religious Education and their sense of belonging to Genazzano FCJ College?

The project prioritised 21st century learning and the four Cs (Keane 2012):

- critical thinking and problem-solving
- effective communication
- collaboration and team building
- creativity and innovation.

The Religious Education unit

The Religious Education unit, 'Belonging to Genazzano', addressed the content area of 'Church and Community' in the Catholic Education Melbourne (draft) Religious Education Curriculum Framework (2018) and three of the area's learning descriptors for Years 7 – 10 (K&U 2, R&R, and P&CE). Through research into the history of the Sisters FCJ and their foundress, Blessed Marie Madeleine d'Houët, the students were prompted to:

- explain the tradition of their school and its connection to the local and global Church community (Knowledge and Understanding — K&U 2)
- interpret the actions of key people in the past and present Church who responded to a call to witness (Reasoning and Responding — R&R)
- reflect on their contribution to the school community and plan ways to contribute to the global Church (Personal and Communal Engagement — P&CE).

Students were encouraged to work in groups to achieve a common goal of producing an app prototype that encompassed their learning for the unit.

Incorporating Digital Technologies

With the Digital Technologies Curriculum, we were focused on the Creating Digital Solutions strand, keeping in mind the overall achievement standard for Year 7 (and Year 8) and the need for students to:

- understand how text, image and sound data can be represented and secured in digital systems and presented using digital systems
- analyse and evaluate data from a range of sources, to model solutions and create information
- manage the collaborative creation of interactive ideas, information and projects and use appropriate codes of conduct when communicating online
- design user experiences (and algorithms incorporating branching and iterations), and develop, test, and modify digital solutions.

Implementing the innovation

Genazzano FCJ College has a dedicated team of Religious Education staff, some of whom have been teaching RE for more than 30 years and some who even attended the College themselves. The idea to design an app in RE could have been met with resistance, as it was new and disruptive to what had always been done. On the contrary, staff embraced this project and demonstrated commitment to the process. Staff knew that they would be supported and that ultimately, the teaching and learning component of the unit remained the same. It was simply the summative evidence of learning that was going to be vastly different. Instead of writing an essay and creating a poster, the students would prototype an app.

The unit began with the introduction to the project, by giving students the vision of where they were headed and the knowledge that every subsequent RE lesson would be relevant to their app. Engagement levels were high. Students were told that at the end of the unit they would be producing an app prototype that demonstrated their understanding of the history of our College, the Sisters FCJ and what makes us a faith-filled community.

After weeks of

- immersing themselves in the story of Blessed Marie Madeleine D'Houët,
- visiting the archive room of the College and interviewing our archivist,
- connecting with alumnae, reaching out to the Sisters FCJ,
- asking questions of our College Principal Karen Jebb,
- emailing College prefects, visiting the chapel,
- analysing artwork and statues that are placed around the grounds,
- learning about the architecture of the Wardell building,
- reading vast amounts of information on the Sisters FCJ and their mission, and
- knowing the story of the six women from whom our sporting houses take their names,

finally the apps were ready to be designed!

Students worked through the design cycle to brainstorm, plan, prototype and evaluate their app and worked together to build their prototype in Keynote, an Apple presentation tool. Keynote is used by designers in the real world when prototyping; however, programs such as POP — Prototyping on Paper, PowerPoint or Google Slides could also be used. Essentially, the students' creation looked and functioned like a real app but did not have the complex coding behind it.

Students were guided by the creation of their 'app statement', which required them to think about who their app is for and what it will do. One example from a student stated that:

> Our app aims to entertain and inform new students about the history and culture of our College in order to retain the memories from the past through interviews, quizzes, photographs and stories.

I attended classes to team-teach with the Year 7 RE staff, as students worked through the design cycle and began to prototype their app. I assisted with the setting-up of their document in Keynote and showed the students a few quick tips and tricks on how to create buttons as links, insert sounds and create a quiz.

From one short teacher-led tutorial grew creative prototypes of which the students were extremely proud. So much so that they would be constantly asking me 'When do we have RE again?' and were running up to their RE teachers to show them the latest information they had added into their app.

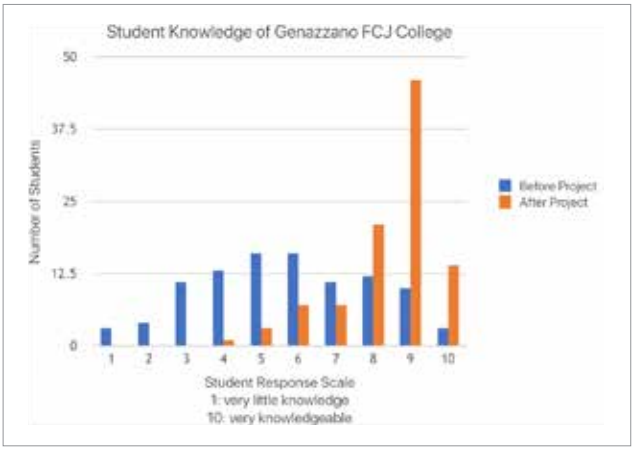
When students begin at the College, we want them to feel a sense of belonging and to understand our history.

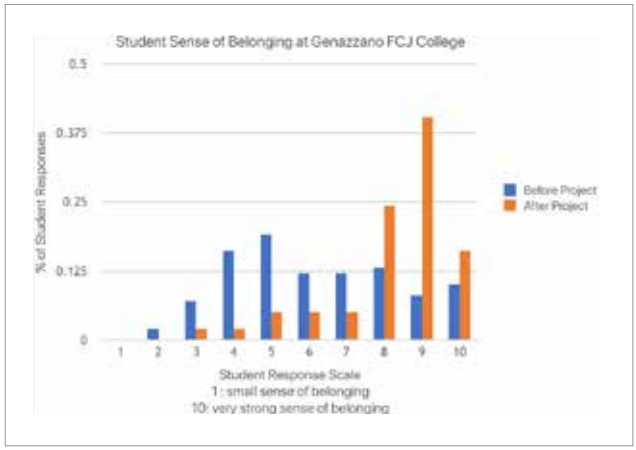
For two weeks the students worked in groups to bring their learning to life through their app, completing their design booklet and using Keynote to create their prototype. The results were beyond what any staff member, including myself, could have anticipated. As teachers we simply planted the seed, and the students with their engagement and enthusiasm enabled this project to grow into something really special.

Analysing the results

The pre- and post-data that I collected really speak for themselves. I surveyed the entire Year 7 cohort and overall, students felt increased connectedness to the College: their sense of belonging increased, as did their historical knowledge. Their technical skills when prototyping improved and students were engaged with their RE lessons.

This is the second year that the students of Year 7 have participated in the App Prototyping Project and the momentum and excitement were still strong. This time, teachers felt confident to present the project with minimal assistance from me, and it was clear they saw the value in the project based on last year's success.





Subsequently, other year levels and subject areas have also experimented with the idea of app prototyping, as a means of showcasing student learning and overall teachers have embraced this as a tool to engage students with tasks that speak to them in their digital world. ▲

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The Reading Village: A girl needs a community of readers (even in secondary school)

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Colloquially, the proverb that 'it takes a village to raise a child' resonates with many people. Equally, it might be argued that it takes a community that values reading and literature to foster a love of books in young people. During the early childhood years, most people agree with this sentiment and are committed to contributing to reading outcomes. Many parents read aloud to their children, teachers record reading level progress, library bag ownership is common, and Book Week is a significant event in the school calendar. Yet, in high school the combined efforts of the community seem to fall by the wayside.

Since 2015, the library at Mount Alvernia College (Mount Alvernia iCentre) has sought to counter this trend and establish a reading culture throughout the school community. This is a significant challenge given social trends in Australia that contribute to decreasing reading rates among adolescents in general, and adolescent girls in particular (Organisation for Economic Co-operation and Development (OECD), 2011; Roy Morgan Research, 2016; Scholastic Australia, 2015). This is the story of the what the iCentre team have learned since embarking on this challenge; the strategic approach taken through research and action; and the establishment of a reading community at the college that has ultimately changed classroom practice, extra-curricular offerings and community engagement in literature.

Why do we insist young people must keep on reading books?

If you conduct a literature review on the research into reading books you will discover that reading makes us smarter and helps promote success in life. Such a review was undertaken by Mol & Bus in 2011. They interrogated 99 studies that focused on leisure time reading, concluding that there is scientific support for the belief that frequent print exposure through reading books has a strong correlation to academic success, oral language development and general knowledge. Further to this, other researchers have concluded that reading has social and career benefits, and positive impacts on wellbeing (Brozo, Shiel, & Topping, 2007; Centre for Youth Literature, 2009; Daley, 2019; Merga, 2019; Miller & Kelley, 2014; Whitten, Labby, & Sullivan, 2016). Meta-studies, longitudinal studies, and national and international studies all conclude that positive correlations can be drawn between reading for leisure and life success. Examples of these conclusions include:

Academic achievement

When examining the associations between print exposure and academic achievement, measured by IQ scores, grade point average, college testing scores and Scholastic Assessment Test Scores, researchers found that readers are more successful students at all ages (Mol & Bus, 2011).

The Organisation for Economic Co-operation and Development (OECD) (2011, p. 2) found that on "average, students who read daily for enjoyment score the equivalent of one-and-a-half years of schooling better than those who do not".

In 2000, the Programme for International Student Assessment (PISA) found evidence that engagement in

reading had a significantly positive impact on academic performance and can "compensate" for low family income and the limited educational backgrounds of parents (Kirsch et al.).

A British longitudinal study found that reading behaviour is strongly linked to test scores in maths, spelling and vocabulary (Sullivan & Brown, 2013,).

Brain health

Merga (2019) quoted several studies that demonstrate reading is good for our brains and has been linked to building resistance to cognitive issues, such as dementia in old age, and contributing to longevity.

Preparedness for work

Data from the International Adult Literacy Survey shows connections between literacy and work opportunities. Higher literacy levels equated to increases in people's ability to secure employment, participate in adult education and training, and earn higher incomes (OECD, 2002).

The Centre for Youth Literature (2009, p. 14) also asserted that by "encouraging young people to read for pleasure, we are improving literacy levels, which will in turn, better prepare school-leavers and college-leavers for the workplace — a good outcome for individuals and for the nation. Young Australians who read for pleasure are likely to be more employable and to contribute more to the nation's economy".

Social outcomes

In 2016 the *Social Cognitive and Affective Neuroscience* journal published psychology research that demonstrated fiction readers possess stronger social-cognitive abilities than both non-readers and non-fiction readers (Tamir, Bricker, Dodell-Feder, & Mitchell, 2016,).

Several studies found that readers have a higher capacity for empathy and understanding other people (Tamir et al., 2016; Oately & Mar, as cited in Paul, 2012).

Clark & Rumbold (2006) cited evidence that reading for pleasure can increase general knowledge, decision making ability, the understanding of other cultures and community participation.

Why do tweens and teens stop reading books for recreation?

Research supports what most of us who parent or teach adolescents know, time spent reading for recreation declines during the secondary schooling years (Centre for Youth Literature, 2009; Manuel, & Carter, 2015; Merga, 2019; Scholastic Australia, 2015). There are numerous causes of this, including competing extracurricular interests, changing curriculum demands, increased screen time, cognitive and skill barriers, and limited parental and teacher knowledge about the importance of reading beyond the early years.

As students enter the adolescent years, their lives get busy. School work and homework increase in intensity and demand more time than they did in the primary years. Secondary schools provide an extraordinary and interesting range of extracurricular offerings including sport, music, public speaking, community outreach and clubs. In these years peers become all important and young people typically start socialising more. By years 9 and 10, some students will take up part-time jobs that add another demand on their time. Reports also indicate as children grow older, reading competes with many screen-related activities (Scholastic Australia, 2016). Accordingly, when students tell us they don't read because they don't have time, it is easy to agree. Yet, research tells us that "keen readers will always make the time for books, but it does deter reluctant or uncommitted readers" (Centre for Youth Literature, 2009, p.5). This indicates that motivation (reading "will") and preference have more impact on recreational reading than competing demands on time. Many teens would prefer to spend their spare time doing activities other than reading (Merga, 2019).

A second cause of reading decline in the secondary years is curriculum demands. One contention is that the crowded secondary curriculum results in class time and homework time being designated to curriculum task completion; and broad learning opportunities such as reading for pleasure are not prioritised by teachers or students (Centre for Youth Literature, 2009). The problem of the curriculum, however, may be more entrenched than this. Research conducted by Merga and Gardiner in 2018, maintains that the issue is two-fold. On a macro level it results from the positioning of literacy in the Australian Curriculum as a General Capability, relatively deficient in ideas and strategies that reflect the value of fostering reading engagement in our students. Secondly, on a

micro level there is a lack of whole-school literacy plans, policies and agreement documents that support reading engagement.

The problem is further exacerbated because many "parents and teachers do not fully understand the importance of reading beyond the early years, so their ability to share a valuing of the practice with their children and students can be limited" (Merga, 2019, p. 2). Additionally, teachers report they need more information and strategies to motivate students to read (Brozo et al., 2008). In the primary school years, the focus of literacy is learning to read. In the high school years, the focus changes and the concept of literacy is broadened to an ability to apply knowledge and skill, to analyse, reason and communicate effectively in a variety of situations (Brozo et al, 2008). In other words, a shift from learning to read, to reading to learn (Brozo et al, 2008). Reading to learn involves students reading increasingly complex texts across all subjects (Merga, 2019). As such, improving learning means improving reading. To improve reading requires practice (Merga, 2019), that is, reading — and on this point fiction books offer greater literacy benefit than other text types (OECD, 2011). Merga (2019) argued that this tenet is not common knowledge among parents, teachers and students, and needs to become so, in order to influence young people to allocate more leisure time to reading.

Finally, cognitive and skill barriers among some students are a cause for reading decline in the adolescent years. As texts become more complex, a student's reading skills need to increase in sophistication. Some students who reached proficiency during the early years, but have not maintained reading frequency, may find reading complex texts more difficult and time consuming than peers who are more able readers (Merga, 2019). Reports also indicate that concentration, even among able readers, can be a literacy barrier. Reading requires focus and multitasking; tiredness, noise and digital distractions can all interfere with concentration. The deep concentration required for book reading can be hard and this impacts young people's preference for reading in their leisure time — given the choice, they will select an activity less cognitively demanding. Addressing this barrier requires promoting opportunities for sustained silent reading to build reading stamina (Merga, 2019).

The Mount Alvernia College response

Australian research conducted by Scholastic Australia in 2015 found that the three largest predictors of reading frequency for children aged 12–17 years are: parents who are frequent readers; a strong belief that reading books for fun is important; and the opportunity to read independently during the school day . Given this, the team from the Mount Alvernia iCentre set out to engage parents and the college community in reading initiatives, collect data to inform and finesse their literacy promotion programme (Campfire), and offer extra-curricular opportunities for girls to participate in the world of literature, instilling a foundation and love of reading.

Reaching out to the village

Research has shown that students are more likely to develop positive reading habits when they have enabling adults in their lives who provide access to books, and stimulate, model and respond to reading. It is important that young people have adults in their lives who demonstrate by their own behaviour what a 'good' reader does (Chambers, as cited in La Marca, 2004). In line with this research, the Mount Alvernia iCentre has developed the Book Chat Breakfast Programme for staff and parents. The aims of this programme are two-fold. Firstly, the programme enables collaboration with all stakeholders, in order to broaden the network of enabling adults to support students' reading development. Secondly, the programme aims to involve staff and parents in the literary life of the college, thus meeting the brief of building a reading culture throughout the school community.

What is a book chat?

A book chat consists of an expert-led talk about great new reads published in Australia and overseas. The book chats focus on new fiction, biographies and some non-fiction for the adults. We also discuss some of the most popular titles for students, for those staff and parents who are interested in the Young Adult (YA) fiction offered in the iCentre.

A book chat is recognised by those in the book industry profession as a way to learn more about books to read, to expand personal reading genres, to give as gifts to friends, family and colleagues, or to receive advice about what might be suitable for the teens, children or babies in their lives (Riverbend Books, 2017). iCentre book chats are modelled on some popular book chats that you may have come across including the Riverbend Books Summer Reading book chats and the 'Chat 10 Looks 3' Podcast series by Leigh Sales and Annabel Crabb.

Parents are invited to attend book chats scheduled to take place on a morning before school each term. The success of the Mount Alvernia iCentre book chats can be measured by their increased popularity, with more parents attending each event.

Staff are also offered the opportunity to attend a book chat. These take place at the end of each semester during the Professional Learning Conferences held within the College. These sessions have become very popular with staff and are booked up very quickly.

Campfire research project: an evidence-based approach to establish more effective reading practices in middle school girls

The Campfire Programme is a fortnightly lesson for Years 7, 8 and 9 students at Mount Alvernia College. During these sessions students are introduced to a wide range of books, borrow books, and read. The goal of this programme is to support all levels of readers and contribute to students' literacy development, by connecting students to books and opportunities to read for pleasure.

Anecdotally, English teachers report that the programme was successful in its goals and borrowing statistics showed large increases in library loans since the inception of Campfire. However, there was no data to demonstrate that a book borrowed was a book read, or that this had any real impact on literacy. To enhance the measurable impact of the programme and to discover any areas where improvement could be made, the iCentre team embarked on an evidence-based project in 2018 under the mentorship of Dr Lyn Hay.

The findings showed that this form of literature promotion and reading programme holds much value for our girls' literacy development and academic outcomes.

Significantly, of the students surveyed:

- 48.54 per cent would not read beyond curriculum offerings without the Campfire programme;
- 49 per cent would never visit a library without the Campfire programme;
- 97 per cent have borrowed a book, directly because of the teacher librarian book chats;
- 70 per cent have read a genre outside their comfort zone;
- three books out of every six borrowed were read from cover-to-cover, two books out of every six were partly read, while one book in every six was not read at all.

The findings also highlighted some deficits in the programme that needed to be addressed in order to improve the literacy outcomes of the participating girls. Significantly, of the students surveyed:

- 57.77 per cent only read for up to one hour per week;
- 27 per cent never consult with peers to identify a good book to read.

The outcomes of this research include:

- establishing a literacy committee to monitor and track reading engagement and literacy development in the college;
- prioritising reading frequency as a goal of the Campfire programme moving forward;
- extending Campfire sessions to include Year 9 students (previously only Year 7 & 8 students attended Campfire);
- sharing the data with students to involve them in identifying reading as important to their academic outcomes;
- embedding a conferencing component into the Campfire programme, to individually track and mentor students toward building behaviours that lead to increased reading frequency, positive attitudes about the importance of reading, and improved technical reading skills;
- developing an action-research cycle to continually monitor and analyse the impact of the Campfire programme;
- sharing the findings of this research with other school library professionals; such as by presenting at The Australian School Library Association Biennial National Conference in April 2019.

Building a reading community: extra-curricular opportunities to be involved in the world of literature and books

Longitudinal research conducted by Oxford University surveyed 17,200 people to investigate the link between extracurricular activities at age 16 and career attainment at age 33 years. The study found:

> reading books is the only out-of-school activity for 16-year-olds that is linked to getting a managerial or professional job in later life. Reading was linked to a higher chance of attending college too. No other activity, including sports, attending concerts, visiting museums, or practical activities like cooking and sewing, were found to have the same effect (Miller & Kelley, 2014, p. xx).

To foster a reading culture and create a reading community, the iCentre team identified that opportunities beyond the classroom were needed to engage students in the world of books and literature. Along these lines, several initiatives have been established. *The Read Like a Girl* project has produced numerous positive outcomes for girls' education at Mount Alvernia College.

Read Like a Girl — Background and project goals

Read Like a Girl is a community partnership that was set up with the goal of literacy advancement of girls and is a combined endeavour led by Helen Stower of Mount Alvernia College in collaboration with Kathryn Schravemade of St Rita's College. Children's Literature Specialist, Pauline McLeod, of Riverbend Books, is a valued community partner. This project encapsulates a calendar of reading events aimed at instilling a foundation and love of reading in the college communities, and more broadly among girls everywhere. The goal was to provide girls with opportunities to attend book events, meet authors, participate in conversations about literature, reading and storytelling, purchase books, network with other girls, women and

people who value reading and academic success, and develop knowledge of the possibilities literacy creates. More recently, the project has been broadened to include writing workshops and opportunities.

To date, the Mount Alvernia College *Read Like a Girl* events have included:

- An International Women's Day Literary Breakfast in 2017, 2018 and 2019. This event invites students and the significant women in their lives, as well as women from the broader College community, to attend a literary breakfast that includes a keynote address by a popular author.
- Three book launches in partnership with Pantera Press Publishing. These events launched the books Draekora (2017), Graevale (2018) and Vadaesia (2019) respectively, by author Lynette Noni.
- A Literacy Week Festival in 2017, 2018 and 2019. This event invites students to participate in a week-long festival that includes literary displays and artefacts, a book-themed morning tea party, a living book presentation and author talks.
- A *Read Like a Girl with your Dad* event in 2018 and 2019. This event invited students, and their fathers or significant males in their lives, to purchase and read the set book and attend a pizza night, with a presentation by the author of the book, Michael Gerard Bauer in 2018 and Tristan Bancks in 2019.
- MTA Book in a Day is an invitational opportunity during Literacy Week for year 9 and 10 students to collaboratively write a book in six and a half hours. The final products have been published on the iCentre website, with all students able to participate in a People's Choice award through online voting.
- An annual Christmas in-store book fair. This event invites all members of the community to a launch evening, followed by a weekend of shopping at Riverbend Books. A percentage of the sales from books purchased over the weekend is allocated to the College to spend on collection development.
- A "Welcome Campfire" held for Year 6 students who will start at Mount Alvernia College in the following year. This event invites students to the iCentre for an evening book chat or author talk and provides them with the opportunity to borrow books over the Christmas holidays, before they formally begin Year 7. It has become a valuable induction activity, allowing girls to feel part of the College community before their official first day of school.
- The *Read Like a Girl* Principal's Reading Challenge is a five-week inter-house competition requiring Home Rooms to record the combined time spent reading for recreation by students and teacher. The challenge culminates in Literacy Week, when the winning Home Room is announced and rewarded with a pizza party. Book voucher prizes are also distributed for the *Best Reader in the House* — the students in each house who spent the most time reading throughout the challenge.

While each school in the *Read Like a Girl* project organises and manages its own events, the schools provide support for one another through a commitment to information sharing, event invitations and attendance, and marketing. For the school library teams, the project has involved collaborating, marketing, and event management. For the students from the colleges, the project has introduced them to wonderful local and international authors, seen them attend and help host literary events such as book launches, allowed them to buy books and engage with authors at book signings, attend writing workshops, network with like-minded readers, booksellers and publishers, and celebrate a love of reading. ▲

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Placing the donor at the heart of advancement

SHONA EICHORN, DIRECTOR OF DEVELOPMENT, PRESBYTERIAN LADIES' COLLEGE, ARMIDALE, NSW; AND BEVERLEY JOHNSON, FORMER DEPUTY HEAD OF ADVANCEMENT AT ST STITHIANS COLLEGE, JOHANNESBURG, AND CURRENT REGIONAL MANAGER OF THE RHODES TRUST & SCHOLARSHIPS IN SOUTHERN AFRICA

The AskRIGHT Advancement Tour to Chicago, from 1924 August 2018, provided an invaluable opportunity for a select group of professionals working as development officers and fundraising practitioners within universities, schools and various Catholic Diocesan Offices across Australia, New Zealand and South Africa to visit the USA. The purpose of the tour was to attend master classes with leading US fundraising experts, see the theory in practice in major Chicago educational institutions, network with others in the industry and share best practice.

The Alliance of Girls' Schools Australasia generously provided sponsorship for development officers from two member schools to participate in the tour. Following an application process, Shona Eichorn, Director of Development at Presbyterian Ladies' College, Armidale, NSW, Australia and Beverley Johnson, then Deputy Head of Advancement, St Stithians College, Johannesburg, South Africa, were selected to participate in the programme. In the article that follows, they share their thoughts on the key learnings from the Chicago Tour.

The Australian context

When asked by her principal to consider applying for an opportunity, partly sponsored by AGSA, on the AskRIGHT Advancement tour to the USA, Shona Eichorn jumped at the chance. Shona writes that: "In my part of the world, access to this calibre of professional development is limited, not only by location but also budget. I have always aspired to "do better", to understand the WHY, the HOW and the science behind the fundraising world in a philanthropic mature culture (you can't go anywhere in the USA without there being a recognition of giving), and the tour was a fabulous opportunity to learn from the best in the business in the USA, along with other industry peers on the tour."

Presbyterian Ladies' College (PLC), Armidale in regional Northern NSW, where Eichorn is the Director of Development, is not a big school. In fact, in the independent, regional, all-girls school's 132-year history it has never been a big school and its philanthropic programme is what could be considered immature compared to most. The girls' day and boarding school is in the university town of Armidale, with a population of 30,000, within a regional community of around 260,000. The school's total enrolment is just over 300 from Pre-Kindergarten to Year 12. Most school funding comes through school fee payment, some government funding, and limited fundraising and private donations.

The community is surrounded by extensive pastoral holdings producing a large portion of the State's agricultural commodities, which are greatly impacted by seasonal climatic conditions. The region is currently in the middle of the longest running drought on record. That combined with average incomes lower than most, has provided ongoing challenges for school fundraising. The College has a Development Office with a team of one full-time and three part-time staff members overseeing all the marketing, events, enrolments, media and communications for the College. In addition, key stakeholder groups, all operated by volunteers, regularly undertake various fundraising initiatives with targeted groups. The Director of Development works closely with the Foundation, Old Girls' Union (Alumni Association), and Parents and Friends Association in this regard.

So, a visit to the University of Chicago where the institution was approaching the end of a US$5 billion Capital Campaign and had 490 Advancement Staff, 75 of whom were in prospect/data research alone, was quite daunting and

IMAGE: DONOR RECOGNITION IN CHICAGO

overwhelming. Eichorn had to remind herself to "breathe and put everything in perspective"! However, while there was a lot to take in, so much valuable information was gleaned on the tour, which has already been applied directly to Eichorn's Australian school.

The South African context

In the South African context, advancement in most schools is in its infancy. It is often misunderstood and the long-term focus on future sustainability is not always fully supported by school heads or boards wanting "quick fixes" and instant results. Many schools in the country are competing for funding with a mushrooming number of NPOs (non-profit organisations) working with the most vulnerable sectors of society; and most schools do not have the dedicated resources or skills to staff Development/ Foundation Offices to drive advancement successfully. From engagement over the last eight years with a forum of school-based development/foundation officers, from a cross-section of public and independent schools in South Africa, Johnson observes "it would appear that staff turnover is high in the school fundraising portfolio."

A high school history and languages teacher by profession, Bev Johnson's first introduction to advancement and fundraising came in 2011, when she was appointed to establish a Foundation Office at St Stithians College. The College (www.stithian.com) is a 66-year-old, independent school in Johannesburg, South Africa. It subscribes to the African philosophy of "it takes a village to raise a child" and offers a unique model of education for students of both sexes from Grade R to Grade 12. Described as a coordinate or synergy model, the College comprises a village of seven schools: six of which operate synergistically on a 105-hectare campus; with the seventh unit, the Kamoka Bush School, situated in the heart of the bushveld near Modimolle, some three hours' drive from Johannesburg.

By South African standards, St Stithians (fondly known as Saints) is a well-endowed, privileged school. The Saints campus is a bountiful estate, with forests, dams for students to practise their Life Sciences and angling skills, extensive waterways, a running track, mountain bike cycling track, bird sanctuary, boarding amenities for high school students, world-class teaching facilities, an aquatics centre and magnificent sporting fields. The College is a "country" school based in the heart of a city, with Africa's richest square mile and central business hub (Sandton) less than five kilometres away. Currently, the St Stithians community comprises some 350 staff members, 1800 families and over 2600 full-time students across the educational phases at the College. Saints offers co-education in the Junior Prep (Grades R–2); and single-sex education from Grades 3–12 in the preparatory schools and colleges.

The College's statement of strategic intent is "Inspiring Excellence. Making a world of difference". It is the latter that finds expression in the sixth school at Saints, the Thandulwazi Maths and Science Academy (www.thandulwazi.com). Thandulwazi derives from the isiZulu for a "love of knowledge". Operating on Saturdays, the academy uses the facilities of the College to offer curriculum enrichment and extra tuition for an additional 1300 historically disadvantaged high school students (Grades 9–12) from 160 under-resourced state schools, serving poor communities across the Gauteng province. In addition, the Thandulwazi Teacher Development Programme endeavours to provide upskilling workshops and professional development for 1600 teachers and school leaders from over 400 impoverished pre-schools and primary schools during Saturday sessions. Thandulwazi has an annual budget of +R13 million and relies wholly on donor funding to operate, with funds sourced mainly from the corporate sector, grant makers and strategic partnerships.

St Stithians College has adopted a broad view of institutional advancement and seeks to develop "a systematic and integrated approach to building and managing relationships with key constituencies and stakeholders in order to attract support" (Inyathelo, 2014). Advancement is a cross campus department servicing all the schools of St Stithians College and covers admissions; marketing and the Saints brand; People Talent (scholarships); public relations and communications; events and sponsorships; Foundation (fundraising, both internally and for outreach); database management and alumni relations; and the archives. In 2018 there were 13 staff members in this department.

Key challenges facing the Advancement Team at St Stithians College include growing the culture of philanthropy; developing a spirit of giving in the broader St Stithians community (students, parents, staff and alumni); and driving strategic, coordinated fundraising campaigns, which are in their infancy at the College. Some of the challenges faced by the Advancement Department, many of which are similar to those experienced by Eichorn's Australian school (PLC Armidale), include:

- St Stithians is seen as a "rich" and well-endowed institution. Why give to such an institution when there are so many dire socio-economic issues and indigent, under-resourced schools in the country?

St Stithians College is a registered public benefit organisation (PBO) and non-profit organisation (NPO). The College relies on tuition fees, paid by the parents, to deliver education to the registered students. The College's "wealth" lies in the land on which it is located. This land is held in trust and cannot be sold off, even though developers eye the campus greedily, given its proximity to Sandton. The precarious state of the South African economy and growing financial pressures on parents wishing to keep their children at an independent school, mean that the College can no longer just rely on school fees to cover capital development projects, staff development awards, and to scholarships to talented students from indigent families. The College must explore innovative ways to attract alternative sources of revenue and funding into the endowment fund.

- Sourcing funding for the Saints Endowment Fund:

The College has a small endowment fund, which the Advancement Office is trying to grow in order to achieve the strategic objectives of the College and ensure the future sustainability of St Stithians. Persuading former parents, current parents (already burdened by high tuition fees), staff and alumni to contribute to this endowment fund remains a challenge.

- Donor fatigue:

A national survey conducted by David Everatt and Geetesh Solanki (2005) concluded that South Africans were a generous nation, with the statistics reflecting that 93 per cent of respondents, rich and poor alike, contributed in cash or kind, both formally and informally, to the upliftment of the broader society. According to the GINI coefficient, South Africa is currently the most unequal society in the world. South Africa is a developing country, still haunted by the "ghosts of apartheid"; and characterised by high levels of unemployment and poverty. South Africans are subjected to ongoing requests for financial assistance from a host of individuals, charities and NPOs. In addition, they pay high rates of personal income tax; with only 13 per cent of the total population (56 million people) contributing to income taxes. Most of the St Stithians parents fall into this category. In the face of increasingly tough economic times, the College is experiencing some push back from parents around fundraising and giving.

- Capacity of the Advancement Office (the so-called A-Team):

The St Stithians' A-Team is a small one: capacity and the investment of the resources (both human and budgetary) needed in the department to attract significant funding remains a challenge. Most members of the Advancement Team are administrators or former teachers by training, with little experience of driving capital campaigns, annual giving campaigns and targeted alumni giving.

- Poor track record of engaging with alumni and past parents:

Until 2013, the College did not have a database of alumni and former parents; and communication with this critical College asset was poor. Moreover, the College did not have a coordinated approach of engaging with alumni and "friend-raising" that would encourage a culture of giving to the school.

> "Alumni are, without question, the single greatest resource an institution has ..."
> (Robert Forman, The President & Fundraising)

Despite success in driving the fundraising for the Thandulwazi Maths & Science Academy over the last eight years, sourcing two bequests, and significant corporate funding for academic scholarships (People Talent) at the College, Johnson still regarded herself as a novice in the increasingly professionalised, competitive and hotly contested fundraising space. Johnson writes: "The AskRIGHT Tour and visits to Chicago-based institutions of learning provided a wonderful chance to gain insights from some of the world's leading advancement teams; explore ways in which other institutions have dealt with the challenges faced by St Stithians College; and see best practice in action. Being awarded a partially sponsored place on the AskRIGHT Advancement Tour was an opportunity of a life-time."

Key lessons learnt from the AskRIGHT tour

Both Johnson and Eichorn agree that, working in a school, one tends to concentrate myopically on the needs of the organisation. The visit to educational institutions in Chicago highlighted the importance of focussing more on the needs of the donor. Seeing donors as "people" and not transactions, allows professional fundraisers to develop a more donor-centric approach while raising funds for one's mission (Haguewood, 2006). This was a key learning from the AskRIGHT tour to Chicago.

Lesson 1: Implementing a donor continuum model in schools

Joe Golding and his wife, Cindy, run a successful fundraising consultancy in Chicago. Their masterclass on the donor continuum was a complete paradigm shift and turned the traditional fundraising model of the donor cycle, below, on its head. Golding argues that this model is problematic in that it excludes the donor from the process:

DIAGRAM 1: TRADITIONAL DONOR CULTIVATION CYCLE

Following extensive research into donors' experiences of giving, Golding encourages fundraisers to focus on people and *why* they give; and advocates a donor-centric approach.

Golding contends that development is about more than the relationship alone: it requires the engagement of the donor's "mind, spirit and soul". His 2017 research shows that 70 per cent of giving in the USA was by individuals (only 16 per cent by Foundations, nine per cent through bequests, and five per cent by corporations).

Why did donors give (in order of priority)?

- Experience of giving
- Monetary motivation/tax incentive
- Paying it forward
- Feel good ("give and ye shall receive")
- Connections to a cause
- Reactive: in response to a crisis
- Gratitude
- Ego
- Guilt

Golding's approach places the donor (not the organisation) at the centre of the fundraising strategy and asks the donor the question: "What would **you** like to accomplish with your gift? And what will be meaningful to **you**?" His approach to development is:

- to invite "philanthropic investment" — inspiring people to give and be part of something without getting anything tangible back, and
- to create meaningful return on philanthropic investment (ROPI).

Golding's Donor continuum focuses on the donor perspective.

Donor motivation: Move the donor along a continuum from 'Ignorance' or the "ought to give", to the 'Ownership' phase where the experience is "deeply meaningful". His research shows that contributions most meaningful to donors are based on some life experience.

DIAGRAM 2: DONOR COMMITMENT CONTINUUM

Creating ROPI for donors

- Successful stewardship is about showing donors the *impact* they have on the lives of beneficiaries.
- The key is to avoid "donor remorse", which usually sets in within 24 hours of the funds being transferred. Akin to bereavement, the donor asks himself: "Was this the best use of my funds?" or "Does this organisation understand the sacrifices I have made in order to make this donation?"

Gift conditioning was another term used by Golding. He argues that "If a donor is surprised by 'the ask', then the fundraiser is getting it wrong". Development officers need to talk to the impact, and bounce around numbers, so that no one is surprised by 'the ask'. Connect the authentic, compelling story to the funding required. As advancement professionals one needs to help donors stretch and think about the impact of their support — we need to help fill the gap between the 'problem and the promise'. The key is to make the donor think about what they would like their gift to accomplish and focus the donor on the question: what would be meaningful to **you**?

Staff and volunteers play an exceptionally vital role in this donor continuum. As in any organisation where each staff member is responsible for its marketing, the same principle applies to philanthropy. *Everyone* in an organisation is responsible for donor stewardship. Golding even suggested that every "development shop" is achieving way below its potential and needs to become more donor-focussed in order to achieve greater success.

In another session, Lindsay Marciniak, of CCS Fundraising, made the point that donors are becoming more sophisticated and strategic about giving. Marciniak advocated Visioning Sessions involving donors. In these reflective sessions it was key to involve the donors and ask for their advice in a meaningful way, which in turn would encourage 'investment'.

Lesson 2: One size does not fit all donors

Seasoned fundraising guru and a published author on the topic of annual giving and online innovations, Bob Burdenski's workshop focussed on the rapidly changing space of annual giving in the USA. Burdenski argues that millennials have disrupted the traditional annual giving campaigns: fundraisers can no longer rely on a one size fits all mailshot or phone call. Like the Starbucks model, which crafts coffee to suit individual desires and needs, and excites the customer about a perfect coffee experience; so too fundraising campaigns are now about catching the donor's attention, focussing on the experience, donor satisfaction and framing support.

We are living in an attention economy with information overload in society. Fundraisers need to adapt and develop an interest-focussed approach that moves from affiliation-based fundraising, to a more donor-focussed, interest-based fundraising model.

Burdenski advises organisations to take a year in the life of giving and to decide what focus suits your purpose; customise annual giving campaigns for the relevant donor segment; and align the message to make it compelling for the donor, and ultimately your cause.

Lesson 3: Identify the donor archetypes in your community

Colleen O'Grady and Sarah Stern, philanthropic strategists from Lipman Hearne, outlined the importance of recognising the different donor archetypes in one's community. Their research focussed on trends in giving to US educational institutions in 2018. Key learnings from their research into 183 billionaires and the pledge statements of 155 of this cohort revealed that:

- There are 1542 billionaires in the world, 33 per cent of whom are US-based.
- Billionaires are seen to have an emotional power over other donors.
- The billionaires researched had pledged 50 per cent or more of their wealth in their lifetime. Their focus tended to be on the dollar amount given rather than why they gave.

- Why did they give?
  - 1 of the 155 gave for tax advantages
  - 49 for fun, joy of giving, self-worth of giving
  - 91 for the unique or novel learning experience
- The Lipman Hearne research categorised high net worth individuals into five archetypes:
  - Closer: powerful; begins with the end in mind; looks for the fulcrum; making large unrestricted gifts is a hallmark.
  - Enthusiast: connoisseur of happiness; "the more I do for others the happier I am"; want recognition; and avoids a formulaic approach.
  - Strategist: knowledgeable; hands-on agent of change; seeks visible signs of change; sees their wealth as fuel for substantive next chapter of their life.
  - Explorer: engaged, earnest learner; new to philanthropy; low key about publicity; sees wealth as a responsibility.
  - World builder: entrepreneurial, global citizen; architect of human experience; want recognition; often prefers masterminding his/her own vision and NGO.
- Their advice was for organisations to listen to their donors; think about their brand through the lens of the archetypes described; and in this way determine if the donor and organisation are the right fit. Fundraising professionals were encouraged to create an archetypal ready toolkit of communication materials.

Lesson 4: Donors who feel they "belong" are donors who give

As part of the admissions process at the Francis W. Parker School in Chicago, the culture of giving is inculcated with the on-boarding of all new parents and staff. Creating a sense of belonging and shared community are fundamental to the success of the development team at this school.

The Parker School makes extensive use of parent volunteers and peer-to-peer fundraising. This is a very deliberate and focussed strategy to create additional capacity in the Development Office and involves alumni, past parents and the current parent cohort in the long-term strategy of the school. Over 200 volunteers, drawn from the Parker school community, assist the school in a range of activities annually, including the on-boarding of new parents at coffee mornings, cultivating prospects, hosting small fundraising dinners in their homes, and assisting the school with making 'the ask'.

Brent Caburnay, Director of Major Gifts at the Francis W. Parker School, made the point that the "strongest ask is the peer-to-peer ask". He and his team often play the role of puppet master: selecting volunteers (as ambassadors of the Development Office), matching them with a prospect and then upskilling/training the volunteer to make 'the ask'. Caburnay and his team focus on personalisation and face-to-face meetings with their community and avoid blanket emails. The Parker team meets every family individually, to grow connections and ensure families (parents and grandparents) feel that they are part of the Parker family. Caburnay contends that "people who belong, are people who give."

Giving at Parker focuses more on participation than the dollar amount with 84 per cent of parents and 77 per cent of staff making annual gifts to the school in 2018.

Lesson 5: Find the "rock star" in your community who will help drive your campaign

The key is to find the 'rock star' in your community who will appeal to the donors, bring back nostalgic memories of school, or be of significance to your school community — it could be a teacher, former head, sports captain, past student or deceased scholar.

"Creating a culture of philanthropy does not happen in a vacuum ..."
Brent Caburnay, Director of Major Gifts, Francis W. Parker School

At Loyola University, their rock star proved to be an aged nun. Loyola's annual campaign, driven in the period known as March Madness (February to April 2018), profiled the university's basketball team (the Loyola Ramblers), using a range of advertising and social media channels, and was spearheaded by a 99-yearold Catholic nun, Sister Jean. Sister Jean was the Ramblers' Chaplain and caught the imagination of the public. By focusing Loyola's campaign on Sister Jean; using the simple slogan of "Keep the faith", and the Ramblers as a "hook", the Loyola development team was able to attract visitors to the campus and then tell the Loyola story. The campaign resulted in the largest freshman class in Loyola's history; and the total amount of gifts to the university increased by 469 per cent.

In summary, the key practical take-homes and observations from the AskRIGHT tour included:

- Know your donors:
  Do the research. Appreciate why donors give to organisations like yours and what impact they hope to see. Additionally, if you want advice, ask for dollars; if you want dollars, ask for advice.
- People give to people:
  Tell the compelling, authentic stories; sell the impact and inspire the donor. Donors do not give to institutions or to buildings, but to people.
- Engage, engage, engage:
  From prospecting, to on-boarding new parents/donors, to building community and alumni relations, to donor stewardship. Philanthropy

is more than the relationship — it is about the engagement (and that doesn't mean just rolling out event after event).
- On–Boarding of volunteers and staff is critical (research at the Chicago institutions visited shows that successful on-boarding of staff can improve productivity by 30 per cent). This applies to new families in the school community as well. .
- Be Bold, be ambitious in making the ask: Aim high and ask early; ask often and ask to capacity. Foster an ask-focussed culture and a giving habit in your community.
- Thank your funders/strategic partners often and appropriately. The prevailing culture of giving and the ways in which the city of Chicago and educational institutions acknowledged, and celebrated benefactors, was best practice in action. Philanthropy and opportunities to give were widely celebrated, recognised and encouraged.
- Display Philanthropic Leadership: Without exception every board member, including members of the institution's executive team, at every institution visited, were donors. It was made clear when board members or trustees were invited to join the committee that the institution expected their T^3 — time, talent and treasure.
- Development is not selling; it is about INSPIRING!

Additional words of wisdom came from two disparate sources:

- The first development officer of the University of Chicago, Frederick Gates 1853–1929), sagely urged fundraisers to "keep absolutely and serenely good humoured." Gates, an American philanthropist, ordained Baptist minister, businessman and major influence in the establishment of the John D. Rockefeller Foundation, directed the first capital campaign that created the University of Chicago in the late 19th century.
- "Do not presume to make decisions for donors …" urged Paolo Camoletto, COO of the Diocese of Westminster, London (UK), when he addressed the group in Chicago. Camoletto noted that one must understand the culture of the community, its style, its issues and its challenges.

In conclusion

Advancement in the USA is certainly a well-recognised, well-resourced and a well-paid profession, and exists within a well-established culture of giving and philanthropy.

From all accounts, it appears that capital campaigns at institutions of learning are lengthening, and the fundraising targets are ever higher. While all the prospecting and stewardship of donors can happen once development teams have their processes in place, the one key learning from the USA, is for fundraising professionals to place the donor at the heart of all that we do.

Thanks

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A flipped approach to mathematics teaching: intended and unintended outcomes

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This paper is a reflection on my first year of adopting a flipped mastery approach (Bergmann, 2016; McCourt, 2018) to one mathematics class.

I spent 18 months investigating flipped learning, completing online courses, attending professional development on the various approaches and talking to teachers with a variety of experiences. I took advice that urged me to 'hasten slowly' as I tentatively flipped one lesson, then a small topic before flipping a whole unit.

The teaching and learning context

I chose a Year 10 (15-year-olds) mixed ability mathematics class of 21 girls. The class had four 50-minute lessons per week. Each student used a fine tipped stylus enabled device with OneNote (2016 or W10 app) — a computer program for free-form information gathering and multi-user collaboration. It gathers users' notes, drawings, screen clippings and audio commentaries. Notes can be shared with other OneNote users over the Internet or a network. OneNote was used to deliver all content, videos, Cornell notes worksheets, activities and mastery sheets. Students completed and submitted all mastery sheets and activities via OneNote.

I used Class Notebook add-in for OneNote, and this was invaluable in the efficiency and effectiveness of administering the class. I was able to create, distribute, review and provide feedback using the built-in tools within Class Notebook.

This was the only class I flipped, my other classes were taught largely along traditional lines, with video lesson support, but no conscious move to increase the amount of active learning time available. This was a deliberate decision as it was a major pedagogical shift for me, and I knew I would need to take small steps.

The Year 10 course consisted of 10 units of work. Each unit was redesigned, based on the mastery learning cycle framework that I adopted from McCourt (2016), and each unit consisted of the following components:

- Unit outline: students could use the outline to track what was covered, completed, and what required revisiting.
- Video Channel: repository for all video lessons for that unit.
- Teaching Notes: a record of all in-class worked examples and supporting notes.
- Worksheets: core activities that contained opportunities for developing fluency, understanding and problem solving.
- Mastery: each unit contains numerous mastery checks, depending on the length of the unit. See an example in images 1 and 2.
- Flipped lessons: each unit had numerous flipped lessons and each lesson consisted of a video, Cornell Notes and two fluency style questions to check for understanding of the video lesson. See an example in image 3.

Discussion and observations

Student Response

I thought I would give the students the initial right of reply in this article, as the idea behind flipping was to look at ways I could enhance the classroom experience, and aim for a positive impact on the learning of mathematics. At the conclusion of the course I conducted a student evaluation survey. The survey had a 100 per cent response rate and Table 1 summarises the responses to 18 scaled questions, with a rating of 1 representing 'strongly disagree' up to a rating of 5 representing 'strongly agree'.

TABLE 1: SURVEY RESULTS

#	Question	Av. rating
1	The flipped classroom is more engaging than traditional classroom instruction.	4.44
2	I would recommend the flipped classroom to a friend	4.94
3	I like watching the lessons on video	4.75
4	I am spending less time working on traditional mathematics homework.	4.13
5	I regularly watch the assigned videos.	4.63
6	I would rather watch a traditional teacher led lesson than a video lesson.	2.38
7	Flipped learning allows my teacher to spend more time working one on one with me than in traditional teacher instruction classrooms.	4.44
8	I spend more time in class practising and deepening my knowledge in the flipped learning classroom.	4.56
9	I am more motivated to learn mathematics in the flipped classroom.	4.56
10	The flipped classroom has improved my study of mathematics.	4.88
11	Short teacher made videos are more effective than sourced YouTube videos at helping me learn course content.	4.88
12	I like to re-watch videos that I have previously viewed.	4.25
13	I find it easier to take notes from the video lessons than I do from a traditional teacher led lesson	4.38
14	I find that I am better prepared for exams in a flipped classroom.	4.63
15	I learn more effectively when I watch the videos compared to traditional teacher led lessons.	4.31
16	Videos help me to catch up on work that I miss when I am not in class.	4.88
17	The flipped learning style classroom is making me a more independent leaner.	4.50
18	The regular Mastery sheets have improved my self-checking of understanding	4.75

TABLE 2: SHORT RESPONSE QUESTIONS

Question	Response 1	Response 2	Response 3
What aspects of the flipped learning classroom do you find more engaging?	A non-classroom environment, where I can learn at home and be comfortable in not understanding.	The ability to pause, slow down and re-watch so that I am able to ensure I understand.	I really like the aspect of already having knowledge about the topic before I enter the classroom. This allows me to apply basic knowledge to more complex situations. I like that class is still engaging as well as having the at home flip lessons.
When do you re-watch videos?	I re-watch videos when I start my revision and study. When I start studying for each topic, I review all of the videos.	Often I re-watch videos if I miss a class and I don't get the opportunity to ask the teacher questions; sometimes re-watching them can be helpful.	When revising or when a concept is brought up in class that I don't remember/ struggle with and, therefore, need refreshing on.
What are the advantages of the flipped learning classroom?	The advantages of the flipped learning are that you can take your own pace on the video and re-watch the videos when it is unclear.	Spending more time in class to ask questions and do worksheets. I learn at a slower pace and it takes me a while to learn and understand things. The flip learning allows me to learn at my own pace instead of the pressure of a fast-paced classroom.	Being able to watch the flipped videos after class if I did not understand that lesson. Also, feedback from the Mastery sheets helps me understand what I need to improve on.
What are the disadvantages of the flipped learning classroom?	You can't ask the questions straight away; you have to wait.	That you can't ask questions as soon as a problem arises.	If I do not understand something when I am at home, this frustrates me.
Please state any other comments you wish to make about the Flipped Classroom	I think it is very useful and has made me love maths this year. I am making good grades because I have been able to learn at my own pace and have full control of my learning.	If we didn't have to take notes while watching the Flipped Videos, the system would be useless. The mastery sheets help me remember topics for longer and more effectively.	When starting a unit with the Flipped Classroom you need to keep an open mind about the new system because it is worth it.
Would flipped learning be useful for other subjects? Why or why not?	Yes, I think flipped learning would be useful for other subjects such as chemistry and physics.	Maths is the only subject in which I would primarily use flip lessons. For largely content-based units, say rock formations in Geography or separation of cells in Biology I would use flip lessons.	It would, but different subjects would have to take a different approach.

Teacher response

Essentially, I was motivated to enhance learning experiences in ways that would improve learning engagement and learning outcomes for students. I was guided by three goals, to:

- reduce homework anxiety for students,
- increase active learning time in the group space, thus allowing for greater one-on-one interaction between teacher and student, and
- enhance teacher-student relationships.

These goals were developed in response to a desire to:

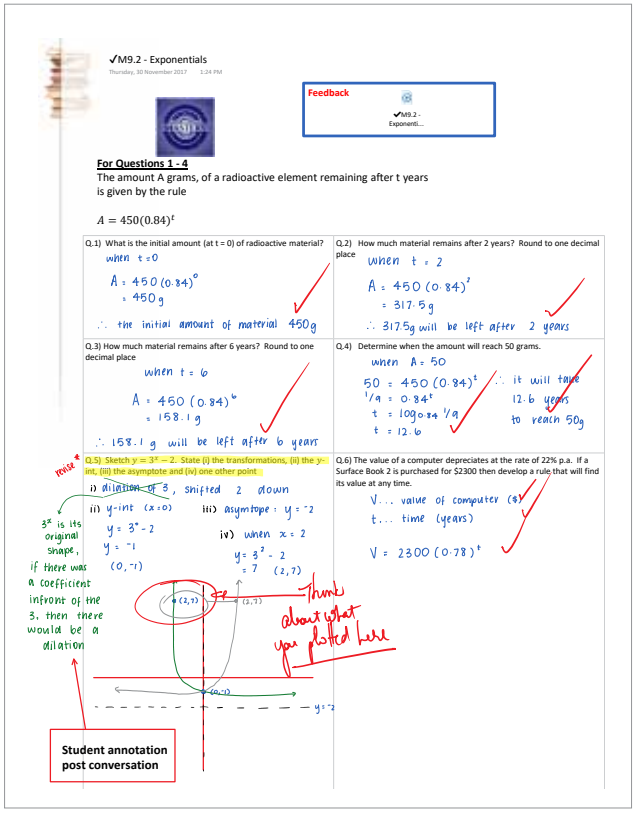
- improve student understanding and application of mathematical concepts, and
- develop strategies that supported the wellbeing of the student.

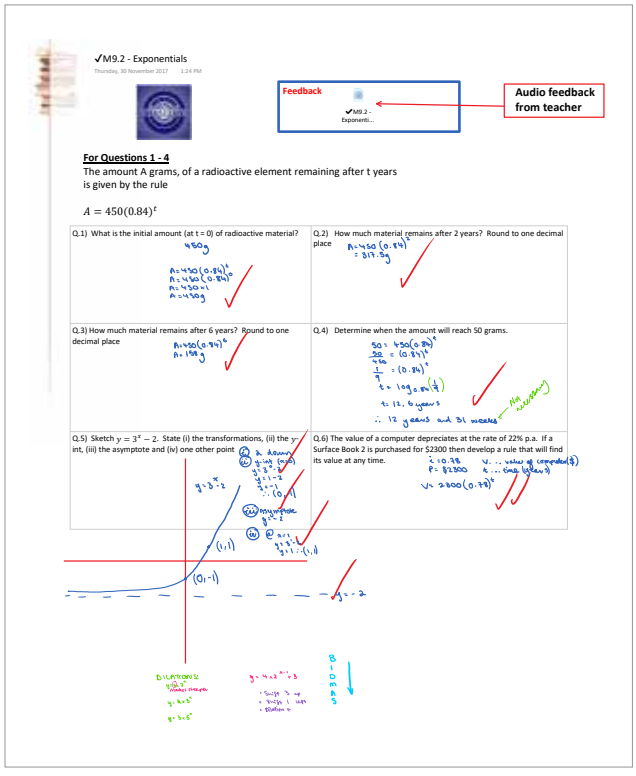
I found, as the year progressed, that the developing relationships between the students and myself were having a far greater impact on the resultant learning than I initially anticipated. It became self-propagating in its nature that, as attitudinal changes to their study of mathematics occurred, so did the students' willingness to engage in positive conversations that revealed the extent of understandings, or not, of a concept. Basically, we were talking on an individual basis much more than I had in the past. This was my number one takeaway from the experience. The additional time I was able to spend in active learning, moving among the students and listening, guiding, correcting, extending, agreeing and encouraging, was reinforcement that this was a significantly improved pedagogically approach. It made me rethink what I meant when I said I was 'teaching'. My previous mindset

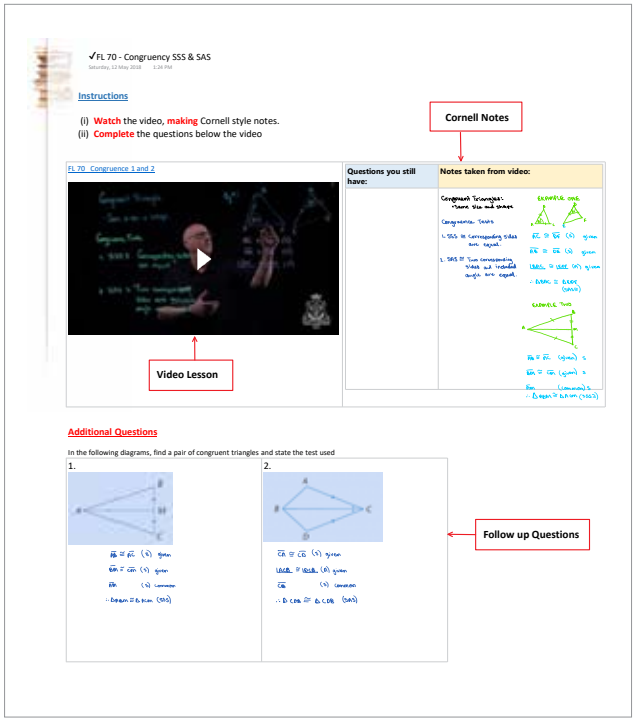
IMAGE 1 (BELOW): EXAMPLE OF A MASTERY TASK

IMAGE 2 (RIGHT): EXAMPLE OF MASTERY SHEET WITH STUDENT ANNOTATED RESPONSE POST MARKING

IMAGE 3 (RIGHT BELOW): EXAMPLE OF A FLIPPED LESSON TEMPLATE







about teaching placed me at the whiteboard, providing guided instruction for much of the lesson and spending some time correcting fundamental misunderstandings. My new mindset still has me at the whiteboard, albeit for a greatly reduced amount of time, allowing greater time to move around and facilitate discussions with students. This is all teaching. One metric that was suggested to measure this 'new' approach was a simple question, 'did I speak to every student in the class during a lesson'? I feel that the students' survey responses support this reflection. Put quite simply, good learning occurs when there are good relationships. Guskey (2007, p. 8) stated

> [r]esearch evidence shows that the positive effects of mastery learning are not limited to cognitive or achievement outcomes. The process also yields improvements in students' confidence in learning situations, school attendance rates, involvement in class sessions, attitudes toward learning.

The second aspect that improved throughout the year was the students' metacognition. Regular mastery checks plus the availability of the flipped lesson videos, meant students developed an improved ability to learn about their own learning. The mastery checks provided the opportunity for timely and specific feedback conversations, both inked and audio, essentially a digitally mediated conversation. Students had the opportunity to review, clarify and update their understanding of specific procedures and skillsets. It needs to be noted that the mastery checks addressed only fluency and understanding (remembering and understanding) aspects of the course. The key knowledge was identified at the start of each unit and I declared this knowledge as 'non-negotiable' or required knowledge, if we were to successfully engage in higher order thinking (applying, analysing, evaluating and creating). I hold to the belief that, in mathematics, creativity follows mastery, so mastery of skills was a major priority. Students are aware of their learning target and our feedback conversations specifically addressed this, and how they can achieve their learning goals. As two students commented "Mastery. It's challenging and a great indication of what I have to especially focus on in my revision" and "I enjoyed participating in the mastery sheets as it showed me what sections I needed to review and work on". Student ratings also provided supporting evidence that mastery has engaged and promoted student self-reflection and regulation of their learning.

The third observation from a teacher perspective is that, through the mastery approach, I had a much clearer understanding of the relative strengths and weakness of individual students, both as learners and in terms of their conceptual understanding of mathematics. My interventions and remediations were differentiated and more specific to each student. For example, on a Geometry Mastery check, two students had responded incorrectly to the same question, but for two completely different reasons. Student A had a solid working knowledge of the rules of geometry, but her inability to simplify a rational expression led to an incorrect response. A review of rational expression was suggested, rather than the traditional response that the student needed more practice with geometry, the old 'work harder', without the essential remediation of the actually issue. Student B was strong algebraically but had confused aspects of basic geometry rules involving parallel lines, therefore a review of geometry rules was in order. I was able to give specific feedback and quite different remediation assistance to each student, in other words, a differentiated response. Providing mastery checks also allowed for a much closer tracking of task completion and student development of mastery. This was where the implementation of the Class Notebook add-in provided a solid platform to ensure the efficiency of the process. This was important because, if this approach is to be successful, then it must be scalable to more than just one class. Ultimately, I 'knew' my students better than I had before and, consequently, my interventions were timelier and more specific, which in turn closed the learning gap much faster than I had previously experienced.

The fourth and final aspect involved examining trends in student academic achievement. There are many mitigating and influencing factors that impact on student academic performance, including but not limited to, maturation, parental influence, peer group social status and relationships. The required data collection, sample size and statistical analysis required to investigate a suggested link between a flipped mastery learning approach and improved academic performance is beyond the scope of this paper. However, using the tracking tool Track One, the following trends were observed:

- Based on summative assessment tasks, 20 out of 21 students were trending upwards by the end of Year 10.
- The mastery flipped learning class recorded a shift, in average student achievement, from a B- at the end of Year 9 to a B+ by the end of Year 10. This is compared to the cohort (control group if you like) that recorded a shift in average student achievement from a B+ at the end of Year 9, to a B by the end of Year 10.
- Compared to the Year 10 cohort, the average student under mastery flipped learning has made an upward shift of over one standard deviation from the end of Year 9 to the end of Year 10.

This data is by no means conclusive evidence, but an observable trend based on a very simple analysis of overall end of year grades, obtained by an aggregation of several summative items recorded on a 15-point, A+ to E- scale. It does suggest that further research may reveal a link between the flipped mastery approach in mathematics and improved student academic performance. Bloom (1984, p. 4) reported that "the average student under mastery learning was about one standard deviation above the average control class". The initial findings of this small group appear to be consistent with the claim made by Bloom (1984).

Conclusion

I do believe that I was successful in achieving my three goals, to

- reduce homework anxiety for students,
- increase active learning time in the group space thus allowing for greater one-on-one interaction between teacher and student, and
- enhance teacher-student relationships.

The aspect that was most challenging was the reduction in time I spent at the whiteboard to allow for more active learning time. Zeineddine (2018, p. 66) stated that "[a]ctive learning engages students in the process of learning through activities and discussion in class, as opposed to passively listening to an expert". I had to learn to let go of the whiteboard and to start being part of the conversation, rather than being the only voice in the classroom. I had to learn to trust that the conversations I was having, hearing and interjecting into, were as constructive and productive as me standing and lecturing. Not an easy task for a teacher of 32 years' experience, and there were periods of serious self-doubt about the changes I was implementing. Please note, I am not advocating a complete removal of direct instruction (DI). DI does play an important part in my teaching of mathematics. I am simply trying to redress the imbalance discussed by Marzano & Toth (2014) where reportedly only six per cent of class time is spent on cognitively complex tasks.

Moving forward in 2019 I plan to extend the mastery flipped learning approach to two mathematics classes. One of my planned classes in 2019 is a Year 10 class so the initial creation of resources will not be required, simply a review and tweaking of the materials and the process, based on lessons learnt in 2018. Year 11 requires the building of a new course from scratch. This happens to coincide with the implementation of the new QCAA syllabi so a rewrite of course material was inevitable. The initial creation of course materials is considerable and should not be underestimated, for example, the completed Year 10 course consists of 84 flipped lessons, 34 mastery sheets and numerous worksheets. This is one of the challenges and barriers of which a teacher needs to be aware. If they are not crystal clear on the why, then the how can be simply overwhelming. I approached it piecemeal and kept one unit ahead with my planning and resource creation. The process does get easier once you become familiar with the aspects and requirements that you want to design into the mastery course.

In closing, the benefits from a mastery flipped learning approach are summarised below. It

- promoted independent learning
- increased the available time for essential, authentic individualised conversations between teacher and student
- provided opportunity for differentiation and timely interventions
- increased metacognition skills in students
- acknowledged and supported the wellbeing of students in the learning process
- increased the active learning time in the group space.
- provided a resource for students to review and reconsolidate essential knowledge
- resulted in an upward trend in academic achievement, measured against the cohort. ▲

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F.R.A.M.E.
The underlying principles of teaching and learning mathematics

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I can trace the origins of F.R.A.M.E. (Feedback + Reflection + Action + Mastery = Empowerment) to a specific moment in time five years ago. I was returning test papers to my Year 9 class. I came to student A and gave her back her paper. I was disheartened by the look in her eyes as she gazed upon her E+ before hurriedly turning her paper face down on her desk. This was not the first time I had handed a paper to a student with a low grade, and this certainly wasn't the first time this student A had received a result of this standard, but it was the point where I thought "this is not good enough".

Einstein defines insanity as doing the same thing repeatedly, and expecting a different result, so, as a new Head of Mathematics, I decided to change what we were doing to try and produce more positive outcomes. After consulting with the principal, it was decided to trial second chance testing with the Year 9 cohort. So, after another week we gave the students a similar test. Most students improved but not all, student A got a B-. I will never forget the look on her face when she got her paper back. When her peers found out, they applauded her, she started to cry and the positive emotion in the room was palpable. While student A did not turn into a child prodigy in mathematics, she did pass senior Mathematics A quite comfortably.

This initial trial was followed by a *Teachers as Researchers Project* with Independent Schools Queensland. The research undertaken gave credibility to the simple idea of offering a second chance. Bloom (1973) and Guskey (1980, 2003) are both strong advocates for second chance testing. They see the first test as providing valuable feedback to both the teacher and the student on the strengths and weaknesses of both teaching and learning. The emphasis is framed around mastery as opposed to performance. Hattie (2017) attributes an effect size of 0.53 to second and third chance testing and an effect size of 0.57 to mastery learning, which indicates significant and positive effects on learning.

Pekrun (2014) gave us valuable insight into the emotions that were clearly visible in the classroom that day and the important role they played in the learning process. Parallels can be seen between Dweck's (2008) growth and fixed mindsets and Pekrun's (2014) work on mastery goals and performance goals. Norman Doidge (2011) led us to some basic research on neuroscience, which meant commonly held beliefs about predisposition to mathematics, had to be challenged.

Many students showed improvement in the second test, and some students moved from a 'D' to a 'B' mark, or even a 'D' to an 'A' in isolated cases. There were also cases where there was no improvement in result. The most interesting findings related to the results of a student engagement survey. More than 90 per cent of the cohort believed that second chance testing helped improve their confidence in mathematics, and they gained a better understanding of mathematics. Almost 70 per cent claimed to be working harder because of second chance testing.

While we have been encouraged by the improvement, we are still frustrated by the students who do not improve or only produce marginal gains in results. We had initially assumed that offering a second chance would provide hope and motivation, which would be catalysts for increased effort, which in turn would produce better results. The comments we write on reports are deliberate in their focus on improvement over grades. This is an attempt to enculturate the attitude, that with effort you can improve, ergo, a growth-mindset. Pekrun (2014) states that students who set mastery goals are more resilient in their learning than students who are orientated towards performance

goals. In brief, performance goals relate to achievement relative to peers.

While second chance testing has provided the motivation to apply effort for some students it has not been the catalyst for engagement to others. Eccles & Wigfield, (2002) reflected on many theories about why students choose to engage in learning. These theories indicate there are many factors associated with a student's environment, and historical, social and emotional influences that impact on a student's motivation. Inherent in these theories is the importance of self-efficacy, self-regulation, and confidence that they have the skills to learn.

F.R.A.M.E. is the evolution of our thinking and practice. It encapsulates our previous research and processes around second chance testing, but also acknowledges we need to address issues of student motivation, and we need to teach students how to learn mathematics.

Zimmerman (2002, p. 65) stated: "Self-regulation is not a mental ability or an academic performance skill; rather it is the self-directed process by which learners transform their mental abilities into academic skills." He also stated that it is possible to teach students skills to develop their ability to self-regulate their learning. He also warned that teachers run the risk of undermining the students' ability to develop these skills by attempting to identify the student's limitations. Zimmerman (2002, p. 65) stated students "must possess the self-awareness and strategic knowledge to take corrective action". The increased ability to self-regulate learning improved motivation and achievement (Zimmerman 1998).

FIGURE 1: TEACHING AND LEARNING FRAMEWORK

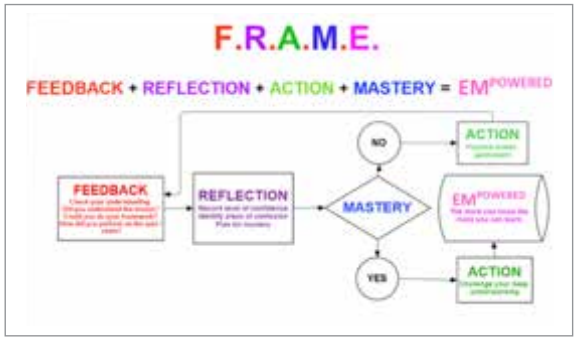


Figure 1 is our model for teaching and learning mathematics at St Margaret's. It is an extension of Bloom's model for mastery learning, Figure 2, and Zimmerman's cyclical model for self-regulation, Figure 3. Our goal is aspirational beyond just teaching mathematics. It now encompasses a focus on developing students' self-efficacy and self-regulatory skills, with the hope that the motivation to engage in learning will extend to a greater number of students than second chance testing.

FIGURE 2: BLOOM'S MASTERY LEARNING PROCESS [SOURCE: GUSKEY, 2007]

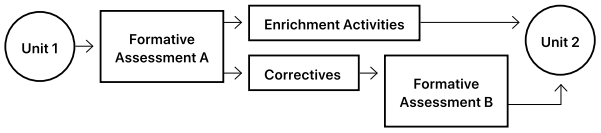
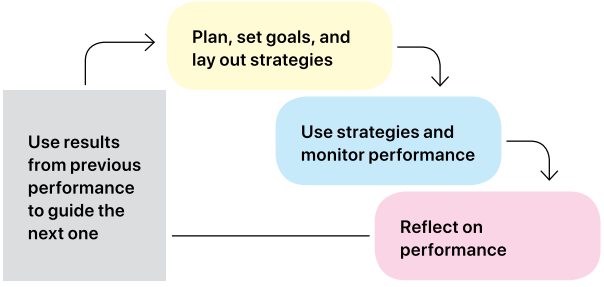


FIGURE 3: THE CYCLE OF SELF-REGULATED LEARNING [SOURCE: SAGE 2YC, 2019]



THE CYCLE OF SELF REGULATED LEARNING
Showing steps students can take throughout the process

The principles which form part of our model rate very highly in John Hattie's (2019) effect list.

- self-regulation strategies [effect size 0.52]
- second/third chance programmes [0.53]
- mastery learning [0.57]
- feedback [0.70]
- evaluation and reflection [0.75]
- effort [0.77]
- deliberate practice [0.79]
- self-efficacy [0.92]
- prior ability [0.94]
- collective teacher efficacy [1.57]

"Collective teacher efficacy is the collective belief of teachers in their ability to positively affect students." (Hattie, 2019).

What we do, starts with the belief that we can positively impact on the learning of all students. I believe that if we put effort into developing students' self-regulatory skills, then students who lack motivation and learning skills can improve their learning outcomes in mathematics.

The F.R.A.M.E. cycle exists within four domains; the classroom, the revision quiz, the first tests and then finally, the second test.

The classroom

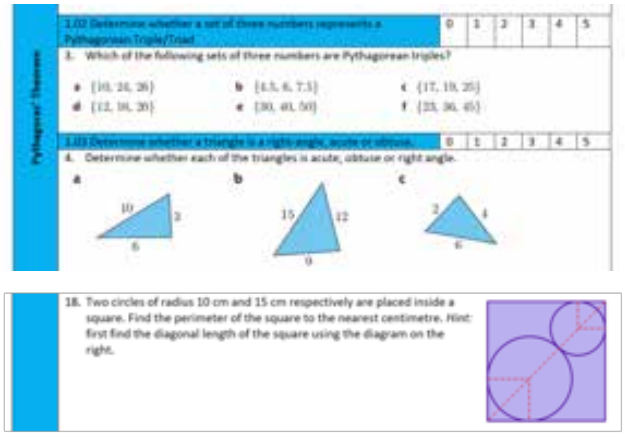
At the beginning of each unit students are given a table outlining the learning intentions for the unit. This is referred to as their Revision and Reflection Spreadsheet (RRS) Figure 4. This is in both printed and electronic forms. The printed form is either the first page of a booklet specially written for the unit of work or a separate sheet which students paste into their exercise books. As each learning intention is covered, the students are asked to rate their level of confidence and shade this on the their RRS. Later in the teaching cycle students are given diagnostic tests, which test many learning intentions. These generally take the form of online quizzes through the platforms provided by Cambridge Press, HotMaths and Mathspace. These are marked online and provide students with immediate feedback on the gaps in their knowledge and understanding. HotMaths provides links back to the textbook for each question, which mean students can easily revisit the work tested. Mathspace provides feedback to students on the individual lines of their working, whereas HotMaths only provides opportunities to submit their final answer. Students are encouraged to reflect on the feedback they receive and re-evaluate their level of confidence based on these quizzes. This is done by shading the level of confidence grid another colour.

The level of confidence grid also provides the teacher with feedback on how each student is progressing. It is often the case that their performance on the quizzes is lower than their original evaluation. This shows students, that while they may understand work when it is covered, unless they continuously practise, that learning will be lost. The quizzes also serve as a means of spaced practice.

FIGURE 4: REVISION AND REFLECTION SPREADSHEET

Year 9 Mathematics			Reflection and Consolidation									
Unit	LI Booklet Reference	Learning Intentions	Level of Confidence						Web Links	Core		Challenge	
		Student should be able to:	0 = I do not remember anything about this 5 = I feel very confident about this							Exercise	Questions	Exercise	Questions
Pythagoras' Theorem	1.01	Understand and recall Pythagoras' Theorem	0	1	2	3	4	5	Khan	3A	1, 2		
	1.02	Determine whether a set of three numbers represents a Pythagorean Triple/Triad	0	1	2	3	4	5				Booklet Pythagorean Triads - POD	
	1.03	Determine whether a triangle is a right-angle, acute or obtuse.	0	1	2	3	4	5		3A	16	3A	
	1.04	Use Pythagoras' Theorem to find the length of hypotenuse	0	1	2	3	4	5		3A	4 to 14	3A	17, 18, 19
	1.05	Use Pythagoras' Theorem to find the length of a shorter side	0	1	2	3	4	5	Khan	3B	1 to 6	3B	7 to 13
	1.06	Apply in 2 dimensions Level One	0	1	2	3	4	5	Khan	3C	1 to 5		
	1.07	Apply in 2 dimensions Level Two	0	1	2	3	4	5	Khan	3C	6, 7	3C 9, 10	Questions at the end of the booklet
	1.08	Apply Pythagoras' Theorem to 3 dimensions	0	1	2	3	4	5		3D	1 to 6	3D	7 to 12
	1.09	Problem solving and reasoning	0	1	2	3	4	5				Questions at the end of the booklet	p230 P's and C's Q's 1, 5, 7

FIGURE 5: EXTRACT FROM REVISION QUIZ



The revision quiz

The revision quiz, Figure 5, is the third opportunity for the students to reflect on their knowledge and understanding. It is an overview of the material covered on the test. The learning intentions are explicitly stated, and the numbering matches their revision and reflection spreadsheets, and their original unit booklets. A range of questions are given for each learning intention, so students clearly understand the success criteria for each learning intention. The degree of difficulty reflects simple familiar, simple, complex familiar, to complex unfamiliar applications as do the questions on the test. We recommend that the students map their level of understanding on the revision and reflection page created for the test, and to use this as a guide to direct their revision time for the test. As can be seen in Figure 4, the RRS has a list of resources alongside each learning intention. These resources range from internet links to exercises in the textbook. The work is also differentiated between core and challenge.

We are moving away from giving students large quantities of, often randomly assembled, revision sheets, especially ones without answers. This does not encourage

the students to use their time effectively and does not require them to make decisions about what they need to focus on. While this process has been trialled in previous years, this is the first year that it is an expectation across Year 7 to 11 cohorts. Initial observations indicate there is a high level of take-up from the higher achieving students. One student's evaluation of the revision quiz, "these are gold".

Round 1 and round 2 tests

Both tests have four parts;

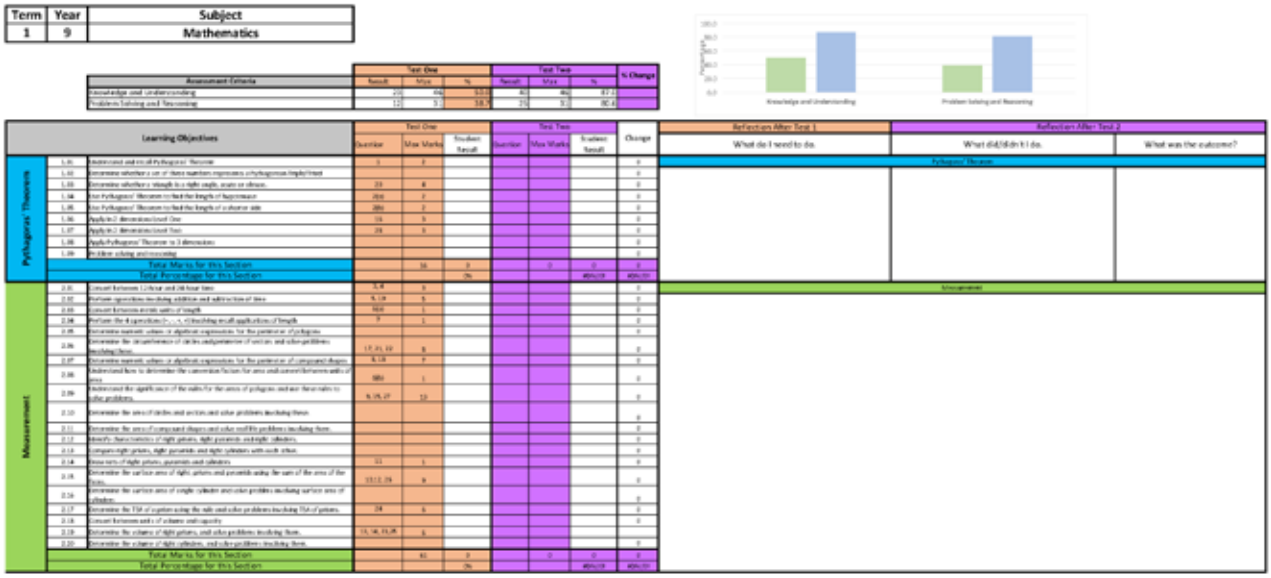
- C/D knowledge and understanding
  The questions in this section are simple familiar. They are similar on both papers with the numbers changed. This is a deliberate attempt to engage the lowest achieving students and show that with effort they can achieve learning. The goal posts are not shifted, and students can trust that any learning they do should pay off.
- C/D problem solving and reasoning
  This section involves simple applications of the skills taught. The focus of these questions is on mathematical literacy and numeracy. There are slight changes in context, but not as far as to make these unfamiliar.
- A/B knowledge and understanding
  The questions in this section test the more difficult concepts and generally involve a combination of concepts. These questions are not the same in both papers. The second paper may link different concepts in a question, or a topic which was tested in the next section may be tested in this section to a different degree of difficulty.
- A/B problem solving and reasoning
  Over time this section has evolved the most. It contains unseen or unfamiliar questions. These questions are designed to challenge the student's ability to formulate solutions rather than regurgitate learned procedures. These questions are different on both papers and may cover different concepts. This is the "pit" of the test, the struggle point.

It is important to note that the first three sections of the paper reflect the learning intentions listed in the revision and reflection document, which reflect the lessons taught. While only the numbers are changed in the questions in the C/D knowledge and understanding, the focus of the A/B knowledge and understanding section is application of higher-level skills and conceptual understanding. All the work tested reflects the clearly documented learning intentions and elaborations of these in the revision quiz. This approach is aligned with the work of Guskey (2003), which emphasises the need for tests to assess what has been taught, and not to try and outsmart students. A test should provide feedback to students on the effectiveness of their learning.

While the A/B problem solving and reasoning section has been referred to as the "pit", students are taught strategies in class and given opportunities to engage in tasks which require them to formulate their own solutions.

At each feedback point; the lesson, the diagnostic quiz, the revision quiz and the round 1 test, students are asked to reflect on their learning. They are required to list their areas of weakness and plan for mastery over the gaps in their understanding. The goal is that these reflections appear throughout their exercise book or unit booklet and it becomes habitual in nature.

FIGURE 6: EXTRACT FROM TEST REFLECTION SPREADSHEET



The test reflection spreadsheet (Figure 6) is the fourth opportunity for students to reflect on the gaps in their understanding. This spreadsheet is only available electronically to the students but is linked to the revision spreadsheet for the test. The students enter their results after the first round and compare these results to the marks allocated for a question. They can then adjust their confidence levels on their previous spreadsheet based on this new feedback. They are also required to enter notes on what they must do to improve on the next round.

For me, the potentially most powerful aspects of this spreadsheet are

- the visual representation of improvement or lack thereof provided by the bar graphs; green representing round 1, and blue representing round 2 results over the two assessment criteria.
- the reflection enabled by the questions; What do I need to do? What did or didn't I do? What was the outcome?

At this point, they are not reflecting on the gaps in their understanding, but on the effectiveness of their plan for improvement and their action.

Hattie and Timperley's (2007) research on feedback and its importance in learning, has prompted an increased emphasis on feedback in schools. In my opinion, the interpretation by schools has been to place greater emphasis on the teacher to provide detailed feedback and analysis of students' work. In this mode the student is passive and the responsibility for successful outcomes, after the feedback, lies with the teacher. As mentioned earlier Zimmerman warns us, in our zest to help students, we need to be careful that we are empowering them and not disempowering them.

The emphasis of F.R.A.M.E. is that students are responsible for interpreting their feedback at predetermined intervals, planning and acting, with the goal of mastering the material. The teacher's role includes setting up the check points, giving students time to reflect on the feedback from the checkpoints, checking that the students record their level of confidence and plan for mastery, and using classroom language which promotes self-efficacy and self-regulation.

F.R.A.M.E., as explained, is in its first year of implementation and the degree of take-up across teachers is varied. It is an extension of second-chance testing which has been in operation for five years. The improvement in results indicated in the following graphs and data is more likely a legacy of second chance testing rather than this new initiative.

The following results are that of the Year 9 cohort in Semester 1, 2019. There is a strong focus on F.R.A.M.E. at this level.

Figure 7 shows the improvement in average percentages for the assessment criteria; Knowledge and Understanding and Problem Solving and Reasoning.

FIGURE 7: PERCENTAGE IMPROVEMENT, FIRST TEST TO BEST RESULT.

Component	Term 1	Term 2	Average
Knowledge and Understanding	6.3%	15%	10.65%
Problem Solving and Reasoning	6.9%	10.4%	8.65%

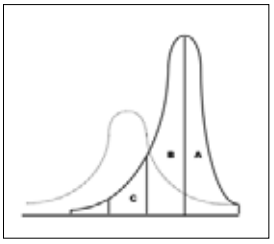
The average reflects an increase in knowledge and skill of over 10 per cent for Knowledge and Understanding and an increase of over 8 per cent for Problem Solving and Reasoning for each student. Interesting, is that the percentage improvement from the Round 1 test to the Round 2 test is more than double for Knowledge and Understanding, and has increased by 3.5 per cent for Problem Solving and Reasoning, in Term 2. This could indicate that students were making better use of F.R.A.M.E. processes in Term 2.

Figure 8 shows the breakdown of the number of each of the grades; A, B, C, D, E, for each assessment criteria, for the first and second tests, in both Term 1 and Term 2. It also identifies the change in the number of each grade. The number of 'As' is increasing and the number of lower grades decreasing. It is obvious from the data that the number of 'Es' and 'Ds' did not change much in Term 1, and although the change in these numbers was greater in term 2, the final numbers for grades 'D' and 'E' were similar in both terms. The predominant movement seems to be from the students achieving a grade 'C' or better.

FIGURE 8: NUMBER OF STUDENTS ACHIEVING GRADES A TO E IN ROUND 1 AND BEST RESULT

Finally, Figure 9 shows graphically, the results of mastery learning. (Guskey, 2007, p. 14). The difference between this model and the outcomes we want to achieve for our model is in the initial standard normal curve. We have built in multiple interventions, which require students to reflect on their understanding, plan and act to achieve mastery. Graphically we would be aiming for a negatively skewed distribution after the first round and an even greater negative skew after the second round.

FIGURE 9: THE DISTRIBUTION OF ACHIEVEMENT IN MASTERY LEARNING CLASSROOMS [SOURCE: GUSKEY 2007, P. 14.]



While the evidence presented is not conclusive and requires much more exploration into its many facets, such as the comparatively level of difficulty of the tests and an evaluation of the perceptions of students, I am encouraged by the results. The second chance testing component of F.R.A.M.E. has always provided hope for students and an opportunity to improve, which many students have embraced. Our next challenge is to improve their self-regulation skills and to sustain this practice until it becomes second nature. ▲

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The creativity of hope: Recognising National Sorry Day

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Each year our college community gathers as one to mark National Sorry Day. Sorry Day has been recognised across Australia since 1998, following the recommendations of the 1997 Bringing them Home report produced by the Human Rights and Equal Opportunity Commission. On this day, our nation remembers and recognises the Stolen Generations of Aboriginal and Torres Strait Islander people. It is a time when we express our deep sorrow for the lasting and ongoing pain caused as a result of the policies and practices that led to the Stolen Generations, hopeful that our expression of sorrow can contribute to healing.

For those who endure the pain of the Stolen Generations, healing is a journey that can happen over a long time, due to the profound damage that forced removal has had on peoples' lives. One of the important steps on this road to healing is the act of recognition — and this is why our school community chooses to mark National Sorry Day with a special assembly.

As well as being a time of sorrow and contemplation, our Sorry Day assembly is also a time of commemoration and admiration, as we consider the achievements, heritage, culture, songs and traditions of Aboriginal and Torres Strait Islander communities.

In our local context, it is a time when we remember that our school stands on ancient land, and we acknowledge that we come together to learn on the traditional country of the Wurundjeri people of the Kulin nation.

In recognising Sorry Day, we also acknowledge the strength of all Aboriginal and Torres Strait Islander women and men who have maintained culture and connection to country, even in the face of institutional and systemic racism. We acknowledge the courage of Australia's First People, who have been consistent in their calls for justice, truth, healing and reconciliation. We acknowledge the wisdom of the traditional custodians of the land, and the deep insights that Indigenous knowledge offers to all areas of human endeavour. We acknowledge the 60,000-year long history of the original inhabitants of our continent, and we celebrate the hope with which our Indigenous sisters and brothers walk proudly towards the future.

However, the full impact of our Sorry Day assembly resonates well beyond the events of the day itself. Much of the learning and engagement that takes place during the assembly is augmented by activities and programmes both leading up to and following on from the event.

Students engaged in our VCAL programme lead the planning for our Sorry Day assembly each year. They meet regularly with our Koori Education Worker, Uncle Trevor Gallagher, to develop the format for the event, and to plan towards its successful running on the day. In 2018, the Victorian Certificate of Applied Learning (VCAL) class hosted Lidia Thorpe, a proud Gunnai-Kurnai and Gunditjmara woman and the first Aboriginal woman elected to the Victorian Parliament. In 2019, under the leadership of our VCAL students, the assembly took as its focus the *Uluru Statement from the Heart* (2017), and an accompanying performance of traditional Wurundjeri dance from the Djirri Djirri dancers. In preparing for the event, our VCAL students were insistent on the importance

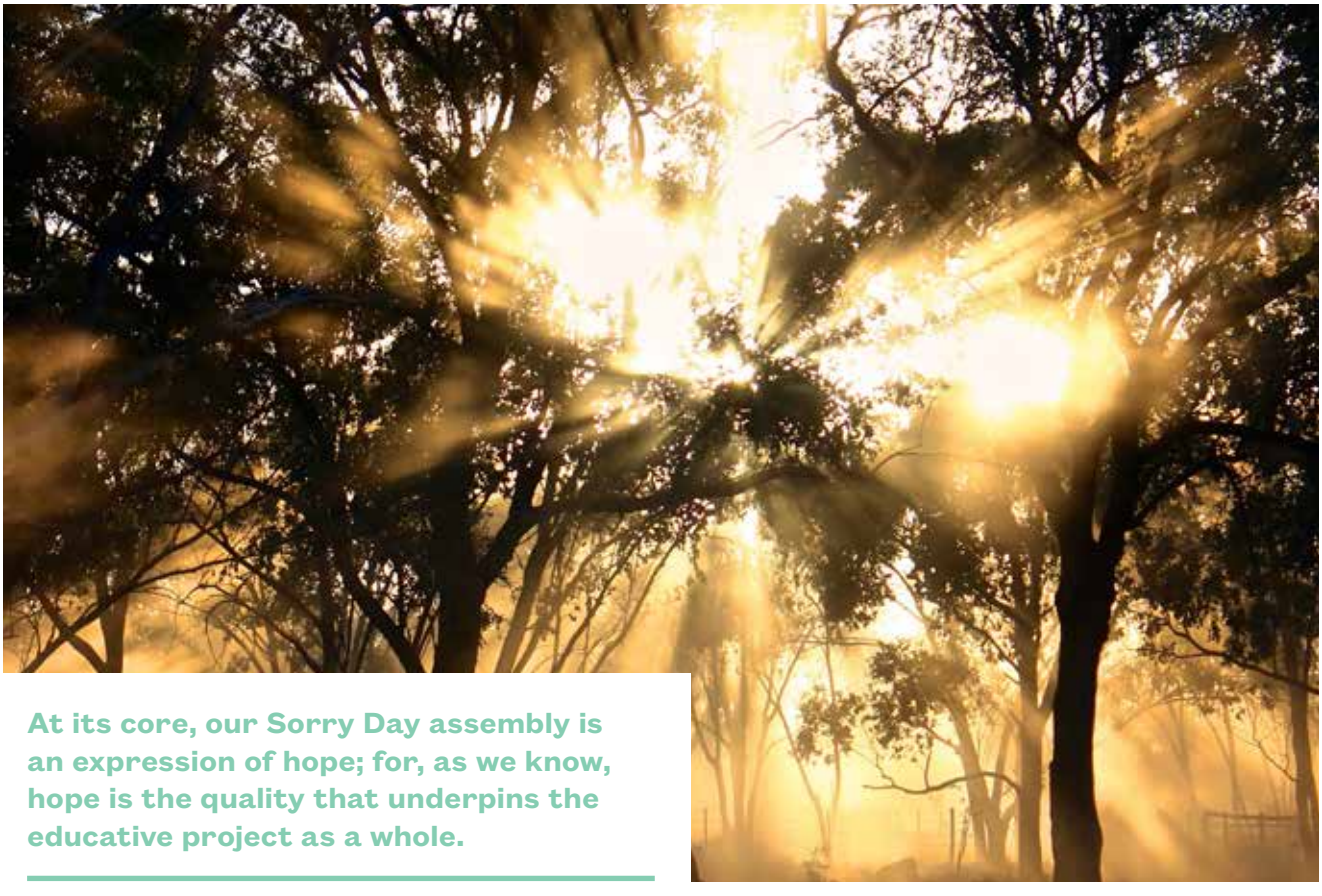
of showcasing the contemporary expression of one of the oldest continuous cultures on the earth.

Our Aboriginal and Torres Strait Islander students also play a special role in our Sorry Day assembly each year. Mentored and supported by Uncle Trevor, our Indigenous students express their own ongoing connection to culture, as our community as a whole takes pride in walking alongside students who carry a heritage of more than 2000 generations of ongoing connection to country.

As our Sorry Day assembly has over time become enshrined within our own school culture, it has continued to be nourished by the creativity of many throughout the school. For this year's assembly, one of our Year 11 students performed a song that she had written about her own desire for healing and reconciliation. Working with our music department, the song was arranged for a multi-instrument band, together with vocal harmonies included to support the central melody. Following its debut performance at the assembly, the song was then recorded for ongoing use across the next fortnight, as part of our daily prayer routine. Heard daily in this way, the song was at once a great example of student creativity, and an ongoing reminder of the need for us to take hopeful, daily steps towards true reconciliation.

Accompanying the musical creativity of our singers and musicians was the significant visual statement made by a nine-metre banner, unveiled at the assembly, bearing the full wording of the *Uluru Statement from the Heart*. Created by the hands of many students, and requiring 20 students to carry it, this banner was unfurled and read as a show of unity with our Aboriginal and Torres Strait Islander sisters and brothers across the country. The statement itself was initially composed by 250 leaders from the Aboriginal and Torres Strait Islander communities, after they met at the foot of Uluru in 2017. Since this date, many voices have declared that it should be read and acted upon, including the Sisters of the Good Samaritan, the Australian Medical Association and the Australian Council of Social Services.

Once our own nine-metre banner bearing the statement had been unfurled and held aloft, we heard the statement read aloud, in the style of a speech choir. As it was spoken, we were each invited to listen with the ear of our heart to the deeper calling for a commitment to healing and truth that the statement represents. In the days



At its core, our Sorry Day assembly is an expression of hope; for, as we know, hope is the quality that underpins the educative project as a whole.

IMAGE: KIESHAYA KNIGHT (YEAR 12) WITH UNCLE TREVOR GALLAGHER

following the assembly, all members of the community were also invited to visit our nine-metre copy of the statement as it hung in our school chapel, to read it, contemplate it, and add their own name to the banner.

As a Benedictine community, time for silence and contemplation is valued as an important element of the learning process. At each Sorry Day assembly, students and staff are invited to process in silence through a smoking ceremony, prepared by our Koori Education Worker. Smoking ceremonies play an ancient and sacred role for Aboriginal and Torres Strait Islander peoples. For tens of thousands of years they have been used as a sign of cleansing and of paying respect. As we passed by the ceremonial fire, Uncle Trevor invited each of us to add a gumleaf to the coals, and to reflect on our own sorrow and desire for healing.

At its core, our Sorry Day assembly is an expression of hope; for, as we know, hope is the quality that underpins the educative project as a whole. It is a hope that our shared sorrow for the lives damaged by the legacy of the Stolen Generations can lead us to truth telling and healing. And it is a hope that is nourished by the remarkable creativity of our students, who share so willingly of their talents and time to produce community events that can hold the complex tension of facing the past with honesty, while approaching the future with optimism and joy. In your own schools and corresponding communities, we invite you to share with us in this hope, and to recognise that whenever we take time to acknowledge the land and her First Peoples, we are acting for justice, truth and reconciliation. ▲

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What do teachers need to know about perfectionism?

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Perfectionism has important educational implications for teachers to consider. For those who are perfectionists, the educational setting may be a significant arena in which their perfectionism is evidenced, exacerbated or addressed. The classroom and broader school contexts have potential to reinforce perfectionism among students. It is also possible that teachers may unknowingly encourage perfectionism in their students. Teachers may also model perfectionistic behaviours.

Certainly, schools are faced with dealing with the range of consequences such as damaged self-concept, underachievement and a range of maladaptive behaviours linked to perfectionism (Nugent, 2000). Teachers can be helped to address this issue via an awareness of the perfectionism literature. Schools may work with students and parents in the general classroom and gifted education settings to address perfectionism. Speirs Neumeister, Williams and Cross (2007, p. 6) suggests "it would be beneficial for schools to work with parents to facilitate an understanding about perfectionism in gifted students". An awareness of maladaptive perfectionism and its origins is argued to help parents and teachers to address the problem and discover alternative methods of coping in a more positive way (Pruett, 2004). Perfectionism may also fit well into the affective curriculum. Nugent (2000, p. 2) contends "Teachers have a unique opportunity to help perfectionistic students reshape their way of thinking".

Types of perfectionism

The general consensus in the literature is that perfectionism is a multidimensional construct with some forms more adaptive than others (Speirs Neumeister et al., 2007). It is worth noting, however, that some authors do not support the idea that perfectionism may have positive or adaptive dimensions (Greenspon, 2000 & 2007; Kerr, 1991). Tables 1 and 2 outline various forms of positive and negative perfectionism referred to in the literature.

Possible contributing factors to perfectionism

Many factors are suggested to contribute to perfectionism in an individual. Most authors agree that the origins of perfectionism are related to the messages that adult caregivers give to their children (Greenspon, 2000). Within non-approving home environments, feelings of inferiority are engendered (Greenspon, 2000). In addition, unrealistically high parental expectations and parents who

Term used to describe negative perfectionism	Author	Key Descriptors
Dysfunctional perfectionism	Porter, 2005	Self-worth linked to success Punitive attitude towards own efforts — sabotage (citing Prichard 1985) Ideals too demanding, avoid risks Procrastination, fear failure
Disabling or clinical perfectionism	Piirto, 2007	Paralysis (not trying) Unrealistically high standards External locus of control Need to live up to unrealistic expectations (in Nugent 2000) Emptiness and dissatisfaction Linked to maladaptive behaviours
Socially prescribed perfectionism	Hewett & Flett, 1991 (cited in Piirto, 2007)	From authoritarianism and parental perfectionism Parental emphasis on obedience Physical punishment by parent Stringent expectations
Unhealthy Perfectionism	Parker, 2000	Correlates with lack of self esteem
Neurotic Perfectionism	Hamacheck, 1978 cited in Parker, 2000	No pleasure from accomplishments
Negative Perfectionism	Chan, 2007	Rigid adherence to high personal standards with similar expectations from others
Perfectionistic thinking	Pyryt, 2004	Dichotomous (all-or-nothing thinking) Transforming desires into demands Focus on unmet goal rather than success
Perfectionism (considered always to be negative)	Greenspon, 2000, 2007	A "wound" Never healthy Concern over mistakes A self-esteem issue
Unhealthy perfectionist types	Adelson, 2007	The academic achiever — must achieve 110 per cent to be satisfied The risk evader — all or nothing The aggravated accuracy assessor — exactness and fixation on re-dos The controlling image manager "I could have won if I wanted to"
Term used to describe more positive forms of perfectionism	**Author**	**Key Descriptors**
Adaptive perfectionism (among gifted)	Porter, 2005	Strive for excellence because gifted and capable of achieving it Not a problem but can be misunderstood and poorly tolerated by others (Silverman 1994, Taylor 2004)
Enabling perfectionism	Piirto, 2007	Guides excellence Pays attention to details and quality For example, writer revising work over and over Flexible in application of perfectionistic standards — free to be more or less perfectionistic
Normal perfectionism	Hamacheck 1978 (as cited in Parker, 2000)	Desirable component of achievement and self-actualization Maximizing potential (Spence & Helmreich, as cited in Parker 2000)
Healthy perfectionism	Parker, 2000	Correlates with conscientiousness
Healthy perfectionism	Silverman, 1999 (as cited in Adelson, 2007)	Leads to achievement Leads to self-confirmation Leads to high self esteem Associated with responsibility
Positive perfectionism	Chan, 2007	Realistic striving for excellence Positive sense of subjective wellbeing Increased life satisfaction and positive affect
Self-oriented perfectionism	Speirs Neumeister & Finch, 2006	Achievement goal orientation Mastery of goals (not performance)

TABLE 1 (TOP LEFT): SUMMARY OF TERMS USED TO DESCRIBE NEGATIVE PERFECTIONISM

TABLE 2 (BOTTOM LEFT): SUMMARY OF TERMS USED TO DESCRIBE MORE POSITIVE FORMS OF PERFECTIONISM

have performance (rather than mastery or learning) goals for their children, contribute to perfectionism (Parker, 2000; Speirs Neumeister et al., 2007). Pruett (2004) also found that parental expectations were the strongest influence on the perfectionism of gifted students. The high demands and expectations of authoritarian parents are thought to contribute to the perfectionism described as 'socially prescribed' perfectionism (Speirs Neumeister et al., 2007). Several authors have also raised the link between insecurity and perfectionism. Greenspon (2000) highlights the insecurity of the parent-child relationship and Speirs Neumeister and Finch (2006) and Spiers Neumeister et al. (2007) examined the role of insecure attachment, parental style and perfectionism. However, caution should be used to avoid blaming parents with Greenspon (2000, p. 6) highlighting that "[i]t should be noted that none of the theories of interpersonal origins of perfectionism is an attempt to put blame on parents. Parents are blameworthy when they intend to injure their children in some way; no such intention is implied here".

The other strong contributing factor in the literature relates to the role of inborn aspects of personality. This is seen as the main cause of the perfectionism exhibited by the gifted 'self-oriented perfectionist' (Speirs Neumeister et al., 2007). Kerr (1991) also raised inherent tendencies as a possible cause of perfectionism in gifted children and Greenspon (2000) saw the sensitive and insecure child as especially vulnerable to perfectionism.

Of particular relevance to educators are several suggested factors contributing to perfectionism. These include; pressure from teachers (Adderholt, 1999, as cited in Piirto, 2007), lack of academic challenge (Speirs Neumeister et al., 2007), use of extrinsic motivation such as rewards and prizes (Kerr, 1991) and lack of awareness of giftedness (Kerr, 1991). Kerr demonstrates how this lack of awareness of giftedness can contribute to perfectionism;

When a child assumes that he or she is "just average", but consistently receives higher marks and consistently performs age-level tasks with ease, then that child begins to search for other explanations for his or her superiority. Children who believe their superiority is purely the result of hard work are in danger of becoming perfectionistic, just as they are in danger of becoming "elitist". (1991, p. 142)

Importantly, a study by Speirs Neumeister et al (2007) found that both self-oriented and socially prescribed perfectionists pointed to "a lack of challenge in their early academic experiences". Their research indicated that "because their early schoolwork was beneath their ability level, they learned they could achieve perfection effortlessly" (p. 2).

Perfectionism and giftedness

Perfectionism has been seen historically as a common characteristic of gifted individuals (Hollingworth, 1926, as cited in Kerr, 1991) and perfectionism is frequently used as a descriptive characteristic of the gifted; "Although there is no universally accepted definition of giftedness, sensitivity, intensity and perfectionism are often used as descriptive characteristics" (Orange, 1997, p. 1). Some authors have gone as far as to describe perfectionism as one of the key elements of the gifted personality that should not be altered (Meyen & Skritic, 1995, as cited in Orange, 1997).

Due to numerous references to perfectionism as a characteristic of gifted individuals, in the literature some researchers have investigated the prevalence of perfectionism among the gifted. There is some debate as to the extent to which perfectionism is present among the gifted, and whether it is more prevalent in the gifted population.

There is also some dispute in the literature as to whether perfectionism is a problem or not for gifted individuals. This extends beyond the debate in the wider perfectionism literature due to the specific characteristics and competencies of the gifted. It is argued to be both a positive and negative dimension in the life of the gifted person. Many authors argue that perfectionism cannot be seen as entirely negative for the gifted. Porter (2005, p. 68) contends that the bulk of research findings show perfectionism in the gifted to be positive and adaptive,

> It is often claimed that gifted children are commonly impaired by a dysfunctional form of perfectionism whereby they strive to achieve unrealistically high standards and are seldom satisfied, no matter how well they do. However, this contention has little research backing…The bulk of findings; however, report that gifted students are perfectionists in adaptive rather than dysfunctional ways (LoCicero & Ashby, 2000; Parker, 1996; Parker & Adkins, 1995; Parker & Mills, 1996).

Similarly, Parker (2000, p. 8) sees perfectionism as playing a role in achievement for gifted children; "… perfectionistic strivings are more likely to stimulate healthy achievement needs than to be associated with personal or academic maladjustment …". Parker points out the difficulty in determining which goals are realistic for the gifted student;

> When dealing with students of typical ability, this question [what is the difference between healthy and unhealthy perfectionism?] is usually easy to answer: Striving for excellence is unhealthy when the goals are unrealistically high. However, when dealing with the gifted, it is much more difficult to determine what goals are unrealistic (p. 2).

Chan (2007) found that gifted students scored higher for positive rather than negative perfectionism, which are consistent with Parker's findings in 2000. Gender has also been found to contribute to perfectionism, in a study which found higher levels of perfectionism in gifted females (Siegle & Schuler, 2007).

Elsewhere in the gifted literature, perfectionism is seen in a less positive light. Kerr (1991) explains the cycle of 'entrenched perfectionism', whereby; the ability to perform perfectly combines with the need to perform perfectly. Piirto (2007) saw perfectionism as an issue for the talented in various domains and cites Adderholt (1999) who found that strong self-monitoring puts adolescent talented at risk. Orange (1997) found that procrastination was the largest perfectionistic problem for 8 per cent of the gifted students studied. Perfectionism has also been viewed as an adverse reaction to stress in gifted students (Bireley & Genshaft, 1991, as cited in Orange, 1997). Pyryt (2004) cites several concerns relating to perfectionism and the gifted. These include underachievement and emotional turmoil. Greenspon (2000, pp. 5-8) sees perfectionism as negative for the gifted, with some gifted individuals being perfectionistic and some not. He refers to literature which highlights the detrimental effect of perfectionism upon success;

> It is possible to be psychologically healthy in many ways, to be a high achiever, and still be perfectionistic. The perfectionism itself is still unhealthy. Some perfectionists are successful despite their perfectionism, not because of it …Examining business executives, law students, high-level athletes, and others has led to the conclusion that perfectionistic strivings tend to hamper success, and that very successful people are not highly likely to be perfectionistic; that is because, in part, self-punishment is an ineffective learning tool (Burns, 1980).

Identifying and addressing perfectionism in the classroom

The literature offers some assistance to teachers in identifying perfectionism among students. In particular, Nugent (2000) drew together classroom manifestations of perfectionism from the work of Cohen (1996) and Pacht (1984). They included: (1) procrastination; (2) delayed engagement in assignments to be evaluated; (3) delay in assignment completion; (4) repeatedly starting over on assignments; (5) refusal to turn in completed assignments; (6) unwillingness to volunteer, share work or participate unless certain of correct response; (7) dichotomous "all-or-nothing" response to evaluation; (8) inability to tolerate mistakes; (9) unrealistically high performance standards; (10) impatience with others' imperfections; and (11) overly emotional reactions to relatively minor errors.

Pyryt (2004) offered some useful questions that teachers and parents can use to identify unhealthy perfectionism in students:

- Does your child pay more attention to mistakes that to correct answers?
- Does your child set unrealistic expectations for their work?
- Is your child dissatisfied with a Grade of A instead of A+?
- Does your child focus on unmet goals, instead of enjoying current accomplishments? and
- Does your child get extremely upset when anything in life doesn't work perfectly?

Pyryt suggested that if the answer is yes to any of these questions the child may be at risk of becoming an unhealthy perfectionist.

Table 3 provides a summary of suggested strategies which teachers can use to address perfectionism in their students.

Conclusion: The role of teachers in addressing perfectionism

Perfectionism is a complex construct affecting the lives of many people. This article has briefly considered proposed definitions, types, and causes of perfectionism. A particular focus has been given to educational implications and suggested approaches to address perfectionism within a school setting. Of particular importance are the questions of whether perfectionism is entirely negative or sometimes positive, and what role teachers can play in addressing perfectionism.

TABLE 3. SUMMARY OF TEACHER STRATEGIES SUGGESTED TO ADDRESS PERFECTIONISM

Author	Suggested strategies to address perfectionism
Brophy & Rohrkemper (1989) as cited in Nugent (2000)	Create a supportive, nurturing learning environment Communicate the expectation that mistakes are an essential part of the process Promote a student-centered atmosphere rather than an authoritative, evaluator-centered classroom Focus on intellectual and personal growth, improvement and the processes of learning, rather than perfect performance Teach students how to choose, plan, reach, and evaluate realistic goals
Nugent (2000)	Create classroom culture (self-evaluation and safe to fail) Sharing of self (teachers talk about own perfectionism) Encourage active listening Encourage self-evaluation and metacognition Bibliotherapy e.g. Robinson's Poem "Richard Cory" used to discuss reasons for suicide including unrealistically high expectations of others Use of humour to promote discussion about perfectionism, e.g. "The crocodile in the Bedroom" from Arnold Lobel's Fables (1990) Use of text to discuss eating disorders e.g. "The Best Little Girl in the World" by S. Levenkron (1978) can be used to look at maladaptive behaviour of anorexia Use art activities (encourage joy, expression & creativity) Discuss difference between excellence and perfection Teach goal setting
Speirs Neumeister & Finch (2006)	Demonstrate acceptance regardless of imperfection Reiterate that self-worth is not contingent upon achievement Develop mastery goals in students by giving interest-based projects Evaluate based on progress rather than product
Pyryt (2004)	Help students match the time commitment to the value of assignments; help them understand weightings Study the lives of eminent people — lessons to learn: 1. path to success not simple or linear — persevere in face of obstacles; 2. great effort is required; 3. Revision and refinement is part of the process; 4. failure can be constructive
Wang, Fu & Rice (2012)	`Normalise maladaptive perfectionists' experiences Manage the distress of not meeting perfection, Don't encourage lowering of high standards (p. 99) Encourage a growth mindset (Dweck, 2006) "demonstrating and modeling that talents and abilities are not fixed and continue to develop" (Wang, Fu & Rice, 2012, p. 105)

The literature offers some consensus on the potential negative consequences of perfectionism for the individual. However, opinion is divided in relation to the existence of positive or adaptive forms of perfectionism. Having considered the different viewpoints it seems most plausible that perfectionism is largely negative, and the notion of "positive perfectionism" has been confused with "striving for excellence". Many of the descriptions of "positive perfectionism" even use the words "striving for excellence". Greenspon (2000, p. 9) agreed with this view and offers an explanation for the popularity of "positive perfectionism" in literature:

> Perfectionism is a wound; it is never healthy, and it may never heal entirely. Perhaps the wish to see some types of perfectionism as healthy is in part a desire not to make oneself aware of this painful reality. ... It is part of an attempt to see some of our own perfectionism as not wholly bad.

It is important to educate students about the distinction between perfectionism and striving for excellence. Pyryt (2004, p. 1) described this subtle distinction "There is a fine line between striving to reach high standards of excellence and feeling self-defeated through the inability to reach unrealistic expectations of perfection. When that line is crossed, the perfectionistic tendencies become disabling". Greenspon (2007) sees the distinction as less subtle, arguing that perfectionism has its origins in conditional self-worth while those who strive for excellence have no dread of failure. Hence, helping students to overcome perfectionism requires that

> ...a new relationship with more affirming others has to develop hand in hand with a new set of beliefs about oneself. Nor is this a short-term project. ...Perfectionism is not a mental disorder that is to be cured; rather, it is a set of beliefs about oneself and one's relation to others that needs time and an affirming relationship with someone in order to be transformed (p. 7).

Teachers can play an important role for the perfectionists in their care – they can become a source of affirmation, gently guiding a transformation which leads the student to develop the healthy ability to strive for excellence. ▲

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What inspired us to work in health research?

JAMIE-LEE THOMPSON, DR OYUKA BYAMBASUREN, STEPHANIE BARWICK, DR IRIS LIM, DR PAULINA STEHLIK, DR SKYE MARSHALL, AND DR AMY BANNATYNE, BOND UNIVERSITY, GOLD COAST, QUEENSLAND

The Health and Medical Sciences sector is rapidly changing. The health care model is shifting from a chronic-care model of diagnosis to a proactive model of prevention. Health care today is consumer-driven, with a focus on wellbeing and early intervention. Approaches to health care are holistic — supporting the mental, social, emotional and physical health of our community.

The Australian health care industry currently employs over 1.5 million people, making it the largest and fastest growing industry in Australia. As healthy ageing and increasing life expectancies place significant demands on the health care system, health expenditure per person is expected to double over the next 40 years. Health and Medical Science graduates are therefore in high demand.

New technologies have made health care more effective, accessible and affordable than ever before. Digital automation will support health care professionals and not replace them. In the future, there may be the concept of virtual hospitals managed by telehealth approaches; 3D printing may be used to generate tissues and implants for reconstructive surgery; the study of DNA (genomics) will assist with the detection and treatment of disease; and tiny artificial intelligence 'nanobots' circulating in the bloodstream will detect and combat infection.

Areas of study available in this field include Medicine, Biomedical Science, Exercise and Sports Science, Health Sciences, Nutrition and Dietetics, Occupational Therapy, and Physiotherapy. Research involves diverse skills from a range of disciplines such as biology, chemistry, business, mathematics, technology, education and engineering.

In this article, inspirational higher degree and early career researchers from the Faculty of Health Science and Medicine at Bond University share their journey from school to a rewarding research career.

Jamie-Lee Thompson, Higher Degree Researcher

When people ask me what I do for work I get really excited, maybe a little too excited. I can't help it though, because I find my project so interesting. I am currently researching the relationship between our genes and skeletal muscle; understanding how genes control muscle wasting. The results of this project will ultimately benefit people who are unable to move properly due to muscle disuse. I think this work is important for people to know about, because muscle wasting impacts everyone at some point — whether through bed rest, limb immobilisation, or old age.

Growing up I always loved maths and science, and I imagined myself one day working in that general area. However I never pictured myself doing what I am now. My main goal in high school was to become a forensic scientist, and not because of all the CSI TV shows (I've still never watched one). I wanted to become a forensic scientist, because I read a Careers Job Guide cover to cover, and that was the job I was most interested in.

At university I studied a Bachelor of Biomedical Sciences, with a research major focused on forensic science. I chose this because it was the closest degree I could find to studying forensic science in general. The physiology and chemistry subjects in my degree were interesting, but I knew early on they were not something I was passionate about and wanted to pursue. However, after undertaking a small research project in DNA profiling, I knew I was not only

Then I found a new adventure, a different kind of academic research at Bond University. We have a worldclass research team at the Institute for Evidence-Based Healthcare.

interested in forensic science, but also research in general. This resulted in choosing to come back for an Honours year, continuing with the same forensic research.

My Honours research project was focused on extracting DNA from fingerprints left on wine glasses. We showed that it is possible to swipe enough DNA from a fingerprint on glass to produce a complete DNA profile and identify the individual. After one year researching, I was hooked. Forensic science wasn't the main goal anymore; instead I wanted to do full-time scientific research.

Fast forward to my current project. I am now a third year PhD candidate researching the genetics of muscle atrophy. In collaboration with the rest of my research group, I have spent the last two years analysing genetic changes in muscle samples provided by our study participants. Our participants underwent a two-week intervention where they wore a leg cast, and we took muscle biopsy samples before and after this period of immobilisation.

Most of my current work analysing this data relies on coding and bioinformatics because of the large amount of data that has been generated, more than five terabytes. Wading through the data to find something meaningful is a very time-consuming process, however we have been able to identify several important biological processes that appear to regulate muscle wasting. These include mitochondrial and metabolic processes, and protein breakdown/synthesis. This research is ultimately aiming to improve quality of life for anyone impacted by muscle wasting.

Dr Oyuka Byambasuren, Higher Degree Researcher

I was born and grew up in Mongolia. I was a big science nerd in school and particularly loved chemistry, physics and biology. They really are the key to understanding the wonders of the universe, the world and the human body — all things I was always fascinated about. Medical school opened a whole new level of awesome science and I fell in love with molecular biology, genetics and immunology. The intricate details of the inner workings of a cell; interactions between different cells, proteins and genes; how they tell friend from the enemy and help keep us healthy, growing and learning — all are just mind-blowing.

After medical school, I moved to Australia and found an opportunity to learn and do research in cancer treatment. I had the privilege to work in Professor Nigel McMillan's laboratory at Griffith University. Professor McMillan is an expert on human papilloma virus (HPV) and his lifelong research on this virus was vital in development of the HPV vaccine in Australia. Several kinds of HPV cause cervical cancer; by helping the human body to defeat HPV infection, we can prevent cervical cancer. I learned to grow cancer cells in lab dishes and treated them with different substances that were meant to kill them, but not the normal healthy cells. It was an awesome experience.

Then I found a new adventure, a different kind of academic research at Bond University. We have a world-class research team at the Institute for Evidence-Based Healthcare here. For the last four years I have been studying smartphone health apps. It is a new and exciting area of research because everyone owns a smartphone nowadays and can access millions of apps freely through app stores, many of which are health-related. I wondered if apps were tested and proven to improve health, whether they could be officially prescribed to patients. When I looked closely at tests and studies of apps, I found that the vast majority of apps in the app stores are not tested but promise all kinds of big claims. That makes it hard for busy doctors, and patients alike, to find suitable apps to use. Now I'm working to create an app library that contains only the best health apps so that your doctor can quickly find a good app for you. I hope one day very soon we all can say "an app a day keeps the doctor at bay".

Stephanie Barwick, Higher Degree Researcher

As the Head of Partnerships, Programs and Innovation at Mater Education in Brisbane, I get to work with a fantastic group of creative people, building partnerships, and creating and delivering innovative education programs and services that both develop today's healthcare workforce and create the workforce of the future. While you might not have guessed it from my current role, I am a Registered Nurse and Registered Midwife.

Since I was quite young, I always knew that I wanted to be a nurse. I went to St. Patrick's College, an all-girls school in Townsville, Queensland, where I was encouraged and supported to believe I could do anything and be anything I wanted. I followed this sense of knowing and an interest in biology and chemistry at high school and went to university, where I graduated with a Bachelor of Nursing Science in 2004. Since then I have completed a Graduate Certificate in Nursing Science (Critical Care), a Postgraduate Diploma of Midwifery, a Masters of Advanced Nursing Practice, and am now a Higher Degree Research student at Bond University. I have lived overseas in Boston, completing a Simulation Research Fellowship with the Centre for Medical Simulation, and have been lucky enough to travel to developing countries, providing education programs to improve healthcare delivery in places that really need it.

Not in a million years did I think that my sense of knowing, and a career decision to go into the health sciences, would lead me on the journey to where I am today — which has been diverse, challenging, exciting, full of opportunities, and one of the best and most rewarding careers I could have ever imagined.

Working in healthcare has taught me skills like compassion, empathy, resilience, leadership, communication, vulnerability, and teamwork — all skills that I have used in every aspect of my career journey so far. It has given me lifelong friendships, wonderful relationships and professional networks that have been invaluable. My thirst for learning has led me to my latest adventure as a Higher Degree Research student at Bond, where I get to combine my interest in simulation education and healthcare, together with my curiosity in the sciences, to undertake original research in an emerging field, looking at how the healthcare consumer is engaged with in-situ simulation (a type of workforce training that is integrated into an active clinical environment).

Dr Iris Lim, Early Career Researcher

There wasn't necessarily a certain point of conversion to science for me as many others in the area probably would have. In my high school years, I remember that I gradually developed a liking and passion for science subjects, especially biology. The more I learned about the complexity of the human body, the more my fascination for it grew. I am from Malaysia and lived there for the first 17 years of my life. Growing up with this passion for science, I was told by most around me (and at some point, naïve enough to believe) that my only option to match these interests of mine was to pursue a career to be a doctor. I am very lucky to have parents who knew better and that there was a whole range of career options in this field for me to explore. After high school, I moved to Australia and started a degree in biomedical science to expose myself to the different areas within medical science.

Throughout my years in this degree, I kept my options and opinions on different medical science-related prospects open, while figuring out which specific areas excite me the most. I conversed with as many lecturers as possible, getting their opinions on what career would best suit my interests and attributes. Towards the end of my degree I was drawn to research in the medicine field, as I realised that while most of my peers wanted to be practicing doctors, I had never felt that that was my calling. I was particularly interested in pharmacology research where the uses, effects and mode of actions of different drugs are investigated. Following my graduation from this degree, I spent five months in a research lab as a research assistant, to get a feel for what it is like and immediately fell in love with working in the lab.

I started speaking to a few different lecturers about the possibility of pursuing this love and passion for research and was drawn to do a PhD with a pharmacology lecturer from my degree. Throughout my three and a half years of PhD studies I was given the opportunity to study potential drug treatments for helping patients pass kidney stones more effectively and less painfully. Besides running experiments in the lab and writing up my thesis, I was also given the opportunity to attend conferences. I presented my research findings at an international conference at Montreal, Canada, and at multiple national conferences around Australia, which I would say were the highlights of my research journey. I graduated with a doctorate two years ago and I am currently still involved in research and, at the same time, teaching at Bond University. If I was given the opportunity to choose to do anything differently in my career path so far, I can say with confidence, that I wouldn't change anything.

Dr Paulina Stehlik, Early Career Researcher

Being a child of a mathematician and mechanical engineer, it probably comes as no surprise that I love mathematics. My Grade 4 teacher helped me realise just *how much* I loved maths — he not only held these crazy arithmetic races every morning but also got us to solve problems almost every day in class. A lot of people think that maths is about numbers. It's not. Maths is all about problem

solving — the numbers and equations used in maths are just the brute-force tools. Working out how to tackle the problem is actually the fun part. And that's the basis of research really — solving real world problems.

While my love for maths and problem solving only grew during high school, I ended up doing a Bachelor of Pharmacy at Monash University, because I wanted to help people. But I always had a nagging feeling it wasn't enough. I was always full of questions and a desire to answer them — not just the what but *why* — research was a natural next step. In fact, I sat my pharmacist registration exam and walked two doors down the road to start my PhD the same day.

Personally, I believe that the scientific method is one of humanity's most important inventions — it's a wonderful process that allows us to understand the world around us. I think that's why my favourite kind of research is on research itself. I did a bit of this during my PhD and reviewed the methods used to develop tools for doctors to use when prescribing medications to elderly patients. More recently I have begun to examine research conducted by medical and surgical trainees as part of their specialty training. Currently I teach clinicians how to understand and interpret research findings at Gold Coast Health, and provide them with methodological support on their research projects. I also run a local Gold Coast Skeptics group where we promote science and critical thinking to the public.

I guess if there is one thing that has motivated me as a woman in STEMM (Science, Technology, Engineering, Mathematics and Medicine), it's that 'knowledge is power' — the more you know, the more empowered you are. I'm always trying to learn more and improve knowledge. In research, there is always something new to learn, something new to discover, something new you can contribute to the world.

Dr Skye Marshall, Early Career Researcher

At school I only seemed to care about the artistic subjects; I was never drawn to science. I didn't notice if I got good grades compared to other students, I only wanted to do well in subjects that I cared about. But this changed when I studied food science and nutrition in Years 11 and 12; all of a sudden, I cared about science — nutrition science. It all just clicked — I just remembered and understood everything, because I was so eager for the knowledge. I had to play major catch up in science when I went to university to study dietetics; but I did well because the science was applied to a subject I cared about — nutrition and health. I ended up winning the University of Newcastle Health Sciences and Medicine Medal for having the highest overall GPA in that faculty. But I never knew I was going well at university until I won that medal — having the internal drive to learn, and not comparing myself to others, is what got me there.

IMAGE (L-R): JAMIE-LEE THOMPSON, DR OYUKA BYAMBASUREN, DR AMY BANNATYNE, DR IRIS LIM, DR PAULINA STEHLIK AND DR SKYE MARSHALL

My fascination with space started around the age of seven, when my grandfather gifted me a signed picture of Andy Thomas, an Australian-born NASA astronaut.

After university I worked for several years as a clinical dietitian. But that didn't last long because I wanted to have long term goals that I could see achieved — I wanted to make a bigger impact and I wanted to know I was really making a difference. That is what research offers. Doing a PhD meant I worked on one single project for three years. I generated new knowledge that had never existed before, and I collected evidence to prove that what I did made a difference for patients. I think I am good at science because of my artistic background; I think art and science are intrinsically linked. To be a good researcher, I need to imagine something that doesn't exist yet, I need to be good at writing, and I need to solve problems creatively. And now that I have finished my PhD, I teach others (students and clinical dietitians) to research. To be a good teacher I need to be creative, flexible and adaptive in how I help others achieve their research goals.

I discovered that the way people are treated in hospital can change, and that hospital shouldn't be an isolating place. Through my experience as a clinical dietitian, I noticed that my patients did better if I involved their family in every appointment — let them contribute to my assessment, to be part of the nutrition intervention, and to keep them involved during check-ups. I turned that into science: I ran a clinical trial exploring the role family has in treating patients in hospital. The results show that 80% of malnourished patients got better when I involved the family; but when we didn't involve the family, it was only 20%. I used my creative and scientific skills to really make a difference for patients in our local hospitals, and that is what I am most proud of in my career so far.

Dr Amy Bannatyne, Early Career Researcher

I'm an Assistant Professor of Psychology at Bond University and a Registered Clinical Psychologist, but neither of these roles were in my career plan growing up — my plan was to become an astronaut.

My fascination with space started around the age of seven, when my grandfather gifted me a signed picture of Andy Thomas, an Australian-born NASA astronaut. I went through most of my teenage years telling people I was going be an astronaut. Year 11 then came around, and the serious conversations about life after school began. At that time, my mother's favourite place to have serious conversations with my sister and I was in the car, so we couldn't avoid her or escape!

One afternoon my mother turned to me in the car and gently queried if I had any other career interests, while skillfully reflecting I had not taken any science or mathematics-based subjects at school, nor was I particularly interested in them. My favourite subjects were English, Food Technology, and Society and Culture. At the time, I hadn't contemplated other career options, but I knew my mother was right. Being an astronaut was a nice fantasy, but it was unlikely to be my reality. The real connection to me wanting to be an astronaut was that special moment I shared with my grandfather, who has always been a source of inspiration for me.

I felt quite lost at the time, and my mother encouraged me to think about other times in my life where I felt inspired by someone or something. Several moments came to mind, but the one that continued to make its way to the forefront was the positive treatment experience I'd been having with a Clinical Psychologist at the time. A couple of years earlier I had been diagnosed with anorexia nervosa, a serious and life-threatening mental health condition.

I spent six years at university studying to become a Clinical Psychologist and another three years doing a PhD. It sounds like a long time, but I made so many incredible friends who live all around the world, learnt lots about myself, and had some amazing opportunities.

These days I spend most of my time researching ways to reduce the stigma around eating disorders. Something I'm particularly proud of is a screening instrument I developed in my PhD that can be used by midwives. It helps identify disordered eating thoughts and behaviours during pregnancy, to ensure pregnant women are receiving appropriate care and support. I recently received the Elaine Dignan Award from the Australian Psychological Society in recognition of this research. When I'm not doing research, I teach medical students clinical communication skills, like how to deliver bad news to patients. Every day my students inspire me. I hope that one day I might get to meet one of you as a student, if I'm not a psychonaut on the moon by then! ▲

Technology, innovation and the future of work

NERILEE CHEN, MARKETING AND COMMUNICATIONS SPECIALIST, ACTURA

As technology continues to transform the way we live and work, students not only have to consider what occupation is right for them, they also need to think about whether that occupation will exist in the next ten or twenty years. The World Economic Forum (2016) argues that "in many industries and countries, the most in-demand occupations or specialties did not exist ten years ago". The global economy is changing, and new technologies and smart companies now lead with new industries and sources of wealth emerging and demanding new skills of workers.

The Foundation for Young Australians (2017) suggests that to equip our students with the necessary skills to navigate the future work landscape, we need to foster STEAM-related skills which are transferable and portable for real-world situations. Investment in these skills should begin in primary school and ideally build throughout each year of schooling. These skills are best learnt in ways that students enjoy; that is, through experience, immersion with peers, and engagement at school and with industry and parents in co-developing opportunities inside and outside of the classroom. Through understanding the skills and capabilities that will be most portable and in demand in the new economy, students can equip themselves for the future of work more effectively (The Foundation for Young Australians, 2017).

Innovation, science and other associated technologies have been recognised internationally as being essential for boosting productivity, creating more and better jobs and enhancing competitiveness and national economies (Australian Government Chief Scientist, 2014). Over the next five years, employment is predicted to increase in professional, scientific and technical services by 14 per cent and in healthcare by almost 20 per cent (Education Council, 2015). The Australian Bureau of Statistics has estimated that some STEAM-related jobs, such as ICT professionals and engineering, have grown at about one and a half times the rate of other jobs in recent years (Education Council, 2015). To stay at the forefront of our international competitors, it is important that we continue to foster STEAM skills, in order to build a stronger and better economy, as STEAM skills have been identified to be the key to successfully navigating the future work landscape.

Immersive out-of-class experience: California Association for STEAM Education (CASE) International Space School Program

Actura's CASE Space School Program is an out-of-class experience that adds real value to classroom learning. The program supports schools as they equip students with essential STEAM skills. At its foundation, Dr Tony Wagner's *Seven Survival Skills* underpins the program with its emphasis on seven core skills — critical thinking and problem solving; collaboration across networks and leading by influence; agility and adaptability; initiative and entrepreneurialism; effective oral and written communication; accessing and analysing information; and curiosity and imagination.

NASA's Johnson Space Center in Houston, Texas, is one of the world's most iconic science and technology establishments, and the perfect setting for students to witness cutting-edge technology and hone their practical and critical thinking skills. This is the environment where Actura hosts groups of students on twice-yearly CASE Space School expeditions. At CASE Space School, students are immersed in enriched and exclusive space science activities and explore the multi-facets of STEAM education in action.

The CASE Junior Space School Program focuses on inspiring and training young explorers. The students discover NASA technologies with industry experts, participate in astronaut training with mission simulations

IMAGE: (L-R) HANNAH, ST MARGARET'S COLLEGE, NZ; TAMARA, ST HILDA'S COLLEGIATE SCHOOL, NZ; LINA, CHRISTCHURCH GIRLS' HIGH SCHOOL, NZ; ISABELLA, CHRISTCHURCH GIRLS' HIGH SCHOOL, NZ PARTICIPATING IN THE FLIPROBOT MARS ROVER CHALLENGE AT SPACE UNIVERSITY, HOUSTON AS PART OF THE CASE SENIOR SPACE SCHOOL EXPEDITION.

and perform shark dissections and cellular analysis to understand the human body in space. There are inspirational guest speakers from within the space industry including industry experts from NASA such as astronauts and engineers. The *Seven Habits of Highly Effective Teens*, coined by Sean Covey is included in the program, instilling important skills and habits in the students. The students are also able to experience cultural enrichment through big atmosphere NBA or MLB sports games, and taste the local cuisine while visiting interesting sites such as the prestigious Rice University.

The CASE Senior Space School Program offers a different approach that focuses on management training for young leaders. The program includes a variety of immersive, space-related experiential activities and challenges, including the opportunity to manage a USD600 million Mission to Mars Project at Space University, Houston. Students learn how to introduce and fund innovation either as a start-up or within an enterprise while learning from some of the best minds in Silicon Valley. The pinnacle of the senior program is the ChallengeX project. ChallengeX requires collaboration and application of STEAM-related skills to solve real space industry problems.

Comprehensive robotic learning: FlipRobot in-class solution

Another facet of Actura's educational programmes is the FlipRobot in-class solution. FlipRobot aims to assist students to sharpen their practical STEAM, robotic learning and coding skills. It robustly provides the foundation for students to develop the right talent, delivering the best in-class robotic platform. The FlipRobot solution consists of five pivotal areas: construct, control, interact, kinetic energy and artificial intelligence. Robotic STEAM learning involves several different strands including coding, constructing, understanding key concepts such as kinetic energy and, of course, using the latest robotics technologies — both hardware and software. Together, the FlipRobot learning kits, in conjunction with the CASE robotic curriculum, are designed to provide students with essential STEAM skills. The curriculum itself is mapped with national standards and is a University of California 5.0 GPA approved college preparatory course. The CASE robotic curriculum covers multiple years allowing for a robotic learning pathway, and includes corresponding lesson plans.

OneWorld Robotics Competition: Smart cities with autonomous vehicles

This year, Actura will also be staging its inaugural OneWorld Robotics Competition, with "Smart Cities" as its solution category. The aim of the competition is to explore the students' resourcefulness in finding solutions to real-world problems with the help of robotic technology, while encouraging critical thinking, problem solving, teamwork, effective communication, and agility and adaptability. Participation will broaden the acquired STEAM-related skills and deepen the critical approach to problem solving, stimulate curiosity and encourage a design-thinking approach. The competition will serve as a platform to generate a range of solutions to each challenge. Students will be able to utilise robots as an integral part of a solution to a real-world problem, while allowing for comparative evaluation of different approaches. The competition will foster collaboration both between team members as well as with members of competitor teams. The adjudication will be carried out by a panel of industry experts and educators. Students will consider the issues surrounding the problems associated with smart cities, such as transport congestion, pollution, environmental sustainability and over-crowding. Students will also consider the relevant social, ethical and legal issues surrounding environmental impact, regulating traffic, accident management and control, and consequent privacy and cybersecurity risks, in conjunction with their application of robotics techniques to arrive at a solution. The adjudication process will focus on the critical thinking process, and not just the technical application of robotics, in assessing what the students finally present. The competition will encompass the use of a combination of soft skills and hard skills to enable students to become future-ready.

Our vision "One student, one robot, one world" strives to create a global network of cooperation in the development of learning STEAM skills. It also gives each student an opportunity to master robotic concepts, apply transferable skills to a wider context, create ideas and hopefully leads them to become valuable members of future societies.

Autonomous vehicles with FlipRobot

A key component of the OneWorld Robotics Competition is considering the significance of the autonomous vehicle and how it may alleviate many of the problems associated with our cities. Studies have shown that autonomous vehicles can cut urban travel time by a third and reduce greenhouse emissions by two thirds, resulting in thirty per cent fewer vehicles in already crowded cities (Information Age, 2018). Students will evaluate the critical role that technology plays, with the autonomous vehicle as a symbol of technological change.

With urbanisation predicated to move into overdrive in the next decade, we need to prepare for this unprecedented pace of growth by developing innovative solutions, embracing new technologies and deploying them to keep roads moving and safe. Autonomous vehicles are a key enabler for the shift from traditional cities to smart cities. A seamless integration of driverless cars into the city infrastructure is required to leverage the true benefits of this cultural change. According to industry estimates, by 2020, the autonomous vehicle market will be worth USD87 billion. Furthermore by 2040, four out of every ten vehicles on the road will be autonomous. Self-driving vehicles will merge with other technologies to give companies a unique opportunity to redefine how they interact with consumers.

Autonomous vehicles will open new opportunities and create an impetus for innovation among organisations in a wide range of industries. They will offer substantial opportunities for a range of technology providers, including companies involved in application development — affecting areas such as big data and analytics, cloud and IT services, security software and vehicle engineering (Accenture Digital, 2014).

STEAM education today and the future of work

Actura recognises the ongoing need to promote STEAM education as a framework for young women, as they navigate the future work landscape. Female students are still underrepresented in STEAM studies and even more so in STEAM careers and leadership roles. Australia's Chief Scientist reported that out of the 2.3 million STEAM-qualified Australians only 16 per cent were female, with the largest gender gap in engineering (Australian Government Chief Scientist, 2014). There is an overarching need to encourage more young women to study STEAM subjects and strive for STEAM-related careers. A Microsoft Study (2018) showed that young women cited a lack of female role

Through providing key role models and educating young women about their impact on the world we hope to inspire them to take up study and careers in STEAM fields.

models in STEAM as a key reason why they did not follow a career in the sector.

To retain more women in STEAM it is crucial to demonstrate how STEAM careers align with their interests, values and desire to make an impact in the world. The most effective way to do this is by integrating real-world relevance in schools, to help young women connect the dots between the changing world and STEAM careers. Through providing key role models and educating young women about their impact on the world we hope to inspire them to take up study and careers in STEAM fields. Specifically, we want to inspire young women to develop their interest and confidence in STEAM through hands-on activities, parental engagement and inspirational role models.

At Actura, veteran NASA Astronaut, Nicole Stott, whose experience includes two spaceflights and 104 days spent living and working in space on both the Space Shuttle and the International Space Station among other achievements, acts as a wonderful role model for young women, particularly those attending the CASE Space School International Study Program. Nicole is CASE's Special Advisor and engages with students as our guest speaker. Recently retired from NASA, and now an educator and an artist, Nicole combines her spaceflight experience and artwork to inspire creative thinking about solutions to our planetary challenges. She works to raise awareness of the surprising interplay between science and art, and to promote the amazing work being done every day in space to improve life here on earth. It is role models like Nicole that provide young women with tangible examples of how STEAM education can benefit them directly and give them the ability to make a difference in the world.

Talent, attitude, passion and opportunity

Actura believes success comes from a combination of *talent, attitude*, *passion* and *opportunity*. The CASE Space School International Study Program, as an out-of-class solution, aims to motivate students to have the right *attitude.* It also ignites and inspires their *passion* to embrace their future pathways. The FlipRobot in-class solution provides the foundation for students to build and develop the right *talent.* We collaborate with educators to provide students with the *opportunity* to pursue their talent, attitude and passion.

The OneWorld Robotics Competition engages students from around the globe to tackle the challenges of smart cities and to hone their STEAM skills in a practical sense. The competition is about students applying what they have learned to a real-world problem and involves their ingenuity in application of skills to find appropriate solutions. The future work landscape will demand that students are equipped with STEAM-related skills. A holistic approach across the educational ecosystem will be imperative, and that is something that Actura is proud to be a part of. ▲

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Digging deep: Uncovering the potential of outdoor play andlearning for girls

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Girls spend a small but important part of their school times in the outdoor spaces around their schools. Whether it is before or after the school day, during break times and lunch hour, or with an innovative educator willing to teach outside the classroom, girls learn, play, and socialise in these outdoor spaces.

These outdoor spaces, and times spent outside, are often overlooked when it comes to acknowledging what really counts in schools. Indoor spaces often trump discussions about the important sites for girls' learning because girls spend most of their school time inside. If asked, many will associate teaching and learning with what takes place inside school buildings and a variety of recognisable 'educational spaces': individual classrooms, libraries, sports facilities, meeting halls, and so on. Most educational research and practice have focused on learning that occurs 'inside', because this is where the majority of teacher-led teaching and learning takes place.

These realities prompt an important question: what about those spaces outside school buildings that are often 'overlooked' — literally and metaphorically — that is, the outdoor play spaces? In this article, we are interested in stepping outside the four-walled learning environment and exploring the benefits of what might be taught and learnt when girls spend time playing and learning in outdoor environments. We place emphasis on school grounds, as this is the most immediate space available for girls.

In this article we examine the multiple benefits of outdoor spaces through an exploration of the ways in which they: 1) provide opportunities for physical activity, 2) enhance health and wellbeing, 3) foster environmental connection, and 4) serve as powerful sites for learning across the curriculum.

Before turning to an exploration of these four benefits, we wish to acknowledge that not all outdoor spaces are the same. Some are, for example, hot, barren and boring — consisting of sports fields, manufactured equipment, and pavement. Other spaces are diverse, natural, soft, cool, colourful, aesthetic and ecologically alive. In these spaces there are rocks to jump on, trees to climb, grasses to hide in, trees to shelter under, butterflies to catch and gardens to tend. In this article, we focus primarily on exploring what happens when girls spend time playing and learning in outdoor spaces.

Benefits

1. Opportunities for physical activity

Well-designed outdoor play spaces that contain moveable natural materials such as sticks, branches, leaves and stones provide endless opportunities for girls to engage in imaginative play, such as building shelters and huts — an appealing and almost universal experience of childhood that starts girls moving through imaginative play. Trees, shrubs, rocks and logs define a variety of places to jump, climb, run, hide and socialise, and enable more diverse opportunities for physical activity, especially for girls. When girls are provided opportunities to play and learn outside, the spatiality of outdoor places affords them the freedom to use their bodies in creative, artistic, responsive, personal and physical ways.

This kind of imaginative, creative and open-ended play can stand in stark contrast to the play promoted by traditional outdoor play spaces that contain sports fields, hard surfaces, and monotonous hot environments. By their design, these traditional outdoor play spaces provide a limited range of play and physical activity opportunities that privilege certain individuals. Research suggests that conventional playgrounds at co-ed schools cater to a

portion of the student population — primarily boys, older students and students with high physical competence, who tend to dominate large open spaces and play equipment that promotes competition. Seen in this light, outdoor play spaces that are carefully designed to promote diversity and natural elements are particularly important for girls.

2. Health and wellbeing

In addition to promoting different kinds of play and physical movement, time spent in well-designed natural outdoor spaces can result in many additional health benefits for girls, some of which are relatively straightforward. When schools eliminate pesticides and increase shade, for example, they are creating healthier ecological settings by reducing girls' exposure to harmful chemicals and ultraviolet radiation.

Another health and wellbeing benefit offered by outdoor play and learning is the opportunity to promote better nutrition through girls helping with food gardening. Rates of obesity are rising among children in Australia, Canada, the United States, and other industrialised nations, with significant physical, mental and social health impacts. Health officials are therefore striving to improve dietary behaviours and are calling upon schools to support healthy eating choices. While attention is focused on the food choices offered in school cafeterias and vending machines, food gardening offers a complementary means of supporting nutrition programs through the design and use of the outdoor play spaces, such as gardens. By planting, tending, harvesting and eating a variety of vegetables and fruits, girls can gain hands-on knowledge about nutritious food and its production. Incorporating a vegetable garden into a broader school curriculum can provide pleasurable learning experiences that have a positive effect on girls' relationship to locally grown food, and provide an important connection to the places where food is grown. Additionally, edible landscapes underpinned by garden-based teaching and learning can influence girls' eating preferences, habits and nutrition knowledge.

3. Environmental connection

Outdoor learning and play that include initiatives such as tree planting, gardening, maintenance and land rehabilitation, provide rich educational opportunities that have the capacity to bring girls into direct contact with the intricacies of outdoor environments beyond the four walls of their school. Through embodied interactions with school ground ecologies, girls can learn to comprehend the systemic and cyclical patterns that are present in these

Teachers who feel confident and competent to take girls outside the classroom for mathematics, English, science, art and humanities (and so on!) provide powerful authentic and embodied learning opportunities.

landscapes and begin to develop an affinity with the basic principles of ecology such as life, earth, forests, water and soils. Girls' engagement with, and comprehension of, non-human life forms is valuable for understanding ecological themes and ideas such as biodiversity, interdependence, food webs and the broader significance of ecological communities. The observation of local phenomena has the potential to develop girls' basic knowledge of ecology, human ecology and the concepts of sustainability, including the ability to solve problems, and expands empathetic connections to the earth, to others and to the places where they live and go to school. Engagement with outdoor places becomes the basis for informing girls' comprehension of how broader systems such as watersheds, farms, cities and communities make up their world. Girls' deepened understandings of how local places function, and their subsequent connection to those places, provide a crucial springboard for how they might comprehend the more complex global aspects to which they are inextricably linked.

Ecology and inquiry-based work undertaken through environmental projects generate a healthy reciprocity between girls and their outdoor environments. Caring for these sites sustains girls' health and wellbeing, whilst shaping their identity as stewards of the land. Once girls become knowledgeable or familiar with a particular place, such as a garden or wetland, and commit to caring for it and taking action on its behalf, they become attached to it, and view themselves as important participants and advocates in processes that involve human action and environmental sustainability.

4. Powerful sites for learning across the curriculum

The role of the teacher in outdoor contexts emerges as a vital factor for enabling girls' learning. Teachers who feel confident and competent to take girls outside the classroom for mathematics, English, science, art and humanities (and so on!) provide powerful authentic and embodied learning opportunities.

Teaching and learning outside, however, are not as straightforward as inside the confines of classrooms. Investigations in the outdoors often generate more questions than answers, drawing attention to the unpredictability inherent in outdoor learning. In the outside world the forces of nature can serve up curiosity as well as productivity, and these responses are, in themselves, grounds for enquiry. Making sense of an outdoor learning experience is often difficult to measure; answers are not always known in advance and can take time, involving return trips to a specific site over extended periods, or follow-up consultation with a book or expert to understand the phenomena at hand. The sighting of a pair of hunting eagles, the accumulated growth of a plant, or discovery of a resident frog can trigger new directions for teaching and learning. These hidden and not-so-hidden ecologies inform every aspect of the girls' outdoor learning, moving them closer to an appreciation of the complex community of interconnections and relationships that exist in the places where they live and go to school.

These processes, which often involve a degree of uncertainty and spontaneity, require teachers to move outside conventional boundaries to develop teaching and learning strategies that are welcoming of different learner knowledges, literacies and subjectivities. Outdoor approaches to teaching and learning require teachers to be available to the possibilities that bubble up at any given moment, in order to support girls' capacity to gain confidence as they grapple with unknown outcomes. Regardless of expertise, teachers need to identify their own comfortable parameters in consultation with broader school policies, which determine how students can work safely and productively out of doors. In contrast to conventional approaches to education that favour teacher's factual knowledge and domination, and which reinforce unequal power relations between the teacher and girls, outdoor learning moves away from question and answer dialogue towards a mutually respectful relationship, where the teacher and girls work together in partnership and wonder.

When learning happens outside, no one subject area is advantaged because each has a part to play in providing experiences that build on one another. A cross-curricula or integrated approach to teaching and learning encourages girls and teachers to draw on previous knowledge, other subject disciplines, as well as everyday experiences to assist learning. For example, girls might utilise mathematical concepts such as 'perimeter' or 'area' to determine the capacity of a school building rooftop to harvest water held in tanks. Similarly, outdoor sites such as a food garden may provide the momentum for personal writing, artwork or science activities. Student learning is focused towards the specificity of the outdoor environment that may be either initiated by the student, guided by the teacher or emerge organically from the place itself.

Barriers

At a time when outdoor environments are challenging 21st century perceptions of the classroom as the prime educational context for teaching and learning, the legitimacy of outdoor learning and play remains questioned and scrutinised by some parents, teachers, school leaders and the wider community. Research suggests that formal and informal outdoor experiences are often perceived by many as filling in time or as a break from the 'real' learning that takes place within the confines of the indoor classroom. As a result, outdoor learning and play can be viewed as

nonessential or peripheral to classroom-based teaching and learning. Such perspectives point towards the need for greater understanding of how teachers and schools come to understand the contributions of local outdoor settings for teaching and learning, and how they might be integrated into the overall curriculum. Further to these considerations is a call for renewed thinking about the spatial organisation of indoor and outdoor teaching spaces, and their influence on girls' bodily movement and learning outcomes.

Inherent within these concerns is the ever-increasing culture of inspection and accountability, including the implementation of standardised testing and national curriculum frameworks that tend to reinforce decontextualised classroom-based teaching practices. Underpinning these institutional and cultural perceptions is the push for an increased emphasis on literacy and numeracy, that 'teach to test'. Such rigid approaches discount the teaching and learning possibilities that exist in outdoor spaces, and fail to take into consideration the potential of contextualised locally-based teaching and learning that awaits beyond the classroom in nearby school ground places.

Conclusion

In this article, we have identified four key benefits that emerge when girls spend time playing and learning outdoors. In our role as academics familiar with the research literature that supports teaching and learning in outdoor contexts, we find the evidence base across the four areas to be convincing and compelling. Equally important, in our role as educators and practitioners, we have worked with and alongside girls, teachers and community members in outdoor learning environments around the world. Our personal experiences add further credence to the contention that outdoor places have an important role to play in the provision of rich and embodied learning opportunities that inform and shape girls' literacies, and in deepening their physical and emotional connections to local places. Overwhelmingly, we witness these settings as valuable contexts for cultivating girls' sense of ownership, dwelling and belonging. One of the many ways schools develop this sense of stewardship is through proactive processes that allow girls to inhabit outdoor places through embodied and experiential opportunities. Taken to the next level, these experiences support and encourage girls' ecological, personal and social understanding of the world, and provide a gateway into their comprehension of, and commitment to, the places that sustain their health and wellbeing.

As noted in this article, the potential of outdoor learning and play remains under-realised. A range of institutional and systemic factors continue to privilege classroom pedagogies and reinforce the ongoing marginalisation of local outdoor spaces for teaching and learning. We believe more teaching, learning and playing needs to happen in outdoor spaces, and we invite expansive discussions around the possibilities for where and how play, teaching and learning may take place. Seen in this light, we maintain that outdoor pedagogies and play have a critical role in girls' formal and informal education. ▲

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The Ovulatory-Menstrual Health Literacy Programme

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A research project at Curtin University's School of Public Health is underway to develop and trial a school-based ovulatory-menstrual (OM) Health Literacy Programme. A sincere thank you is extended, in alphabetical order, to the heads of curriculum, nurses, pastoral carers, psychologists and teachers from the member schools of the Alliance of Girls' Schools Australasia who have generously offered their time and expertise to this project. The programme's protocol paper was published earlier this year by the *British Medical Journal*. It describes how the programme will be developed and trialled, and why it is important (Roux, Burns, Chih & Hendriks, 2019). This article serves to update the Alliance on the aims and progress of this project.

One way the OM Health Literacy Programme challenges the secrecy, shame and stigma surrounding adolescent girls' OM health literacy is by taking a whole person approach. This expands beyond mere biology to include the spiritual, intellectual, social and emotional dimensions of human existence. Using a rigorous peer-reviewed process in development, the OM Health Literacy programme aims to offer teachers confidence and capability to deliver lessons that help girls flourish both now and in their future reproductive lifetime. As an experiential program, girls are offered a positive way of thinking about their own OM cycles as a personal health monitor. For those girls with common OM health issues, which are known to impact schooling and their quality of life, the programme will address how girls can engage confidently and effectively with health care service providers.

In 2015 the *American College of Obstetricians' & Gynecologists'* Committee for Adolescent Health Care and the *American Academy of Pediatrics'* Committee on Adolescence reiterated their joint recommendation that the OM cycle is to be considered a "vital sign" that acts as a powerful tool to assess development and to exclude pathology (ACOG, 2015). In other words, the OM cycle has the same value as our other vitals, such as pulse and respiration. It is easy to imagine the reaction if any of these vitals falter. But what are the reactions that adolescent girls observe about OM cycles as they stand on the edge of the next 40 odd years of their reproductive lives?

Girls' experiences of OM health

For starters, there's no denying the challenge of framing the OM cycle positively when it can come with a variety of health issues, for which few girls seek help. The one most commonly experienced is dysmenorrhoea (or cramps). A Perth study of girls aged 15–17 (n=388) reported an 80 per cent prevalence of dysmenorrhoea, with 37 per cent advising that this affected their school activities. However, only 18 per cent of girls had sought help (Hillen, Grbavac, Johnston, Straton & Keogh, 1999). Another OM health issue for girls is abnormal bleeding patterns. A Canberra study (n=1051) found 39 per cent of girls reported spotting and one per cent of girls bled for more than 10 days. Additionally, 96 per cent of these girls reported premenstrual syndrome. However, only 33 per cent of the girls overall had sought help (Parker, Sneddon & Arbon, 2010). Finally, a Melbourne study of girls aged 13–18 (n=184) with poor OM health found that, not only was their schooling

affected, but their quality of life scores were worse than adolescents with cystic fibrosis (Nur Azurah, Sanci, Moore & Grover, 2013).

These OM health issues, either experienced or witnessed, combined with predominantly disparaging written and oral communication of menstruation, are thought to carry ramifications for body dissatisfaction and body shame (Agnew & Sandretto, 2016). It also comes as no surprise that the onset of menstruation and its necessary weight gain are associated with girls becoming concerned about their body image and losing weight, with some developing eating disorders (Abraham, Boyd, Lal, Luscombe & Taylor, 2009). This is particularly so for those experiencing menstrual dysfunction (Ålgars et al., 2014).

The teaching experiences of OM health

Alongside family, teachers too walk with girls as they undergo their rite of passage into womanhood. Ideally, teachers are comfortable, confident and capable of delivering OM health programmes which are so deeply personal (Chrisler, 2013). However, in some primary schools for example, less than half of female teachers (n=29) felt "very confident" in teaching menstruation (Duffy, Fotinatos, Smith & Burke, 2013). In secondary schools, it has been observed that teachers can lack confidence to deliver sexuality and relationships programmes (Burns & Hendriks, 2018). Of those teachers who gamely deliver OM health programmes themselves, the complexity of the adolescent OM cycle becomes rapidly apparent. Unfortunately, misinformation does nothing to aid them. For example, a common refrain that "a girl can get pregnant anytime" contradicts verifiable facts on female fertility. The systematic literature review of this project also found a menstrual health programme released this year which depicts the luteal phase of the OM cycle as variable. In fact, it is the most stable phase (Vigil, 2019). It's a critical detail for a girl to know if she wants to manage an irregular cycle.

Consequently, teachers can be reluctant to teach girls about their OM cycles. One solution is a "vaccination" delivery of information by parachuting in external facilitators (Goldman, 2011). There are several organisations which deliver menstrual health programmes and the awareness they raise is commendable. However, there is little peer-reviewed evidence of the frameworks used to develop these programs. This risks accuracy in emphasis. For example, menstruation is invariably given centre stage, which is understandable: it is so obvious and demands action. Really though, ovulation governs the OM cycle (Vigil, Ceric, Cortés & Klaus, 2006). Ovulation determines whether menstruation has occurred rather than a breakthrough bleed which can then be mistakenly called "a period" (Jamieson, 2015). Another concern is that the efforts of empowering girls to embrace their "moon time" and to "go with their flow" can be suggestive of a girl's energy, happiness and even creativity being diminished at various times of her cycle (McKay, 2018). If a girl is not well at any time of her OM cycle, then appropriate attention and care is warranted.

Assessment according to curricula requirements is an important consideration for schools. At present, there are no valid and reliable instruments to measure adolescent OM health literacy. Research and development of quality instruments takes time: from establishing content and face validity for accuracy, to ensuring reliability for precision and consistency. Nonetheless, these are important instruments because they give assurance to schools that an investment in any given OM health programme does deliver expected results.

In working towards the goal of a research focused and evidence-based OM Health Literacy Programme that is mapped to the Australian curriculum, this project has convened a Delphi panel. This is a highly respected and established group consensus methodology and it usually consists of six to 18 experts (Okoli & Pawlowski, 2004). The panel to develop the OM Health Literacy Programme is considerably larger because experts from two diverse fields are generously contributing: namely, medicine and education. Already it seems that there can be challenges in reaching consensus when there are different experts with differing opinions as to what is medically and pedagogically necessary for an adolescent girl to have OM health literacy.

So, it is easy to see how the development of OM health programmes can fall into the too hard basket. However, we think that it is well worth the effort, and progress has been made. The vast assortment of enthusiastic and enlightening opinions on how best to succeed confirms this. The project will continue to be developed through 2020. If this area of research interests you, please feel free to connect with the corresponding researcher who would welcome your comments and insights into how girls are taught about their OM cycles. ▲

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Becoming a beginning principal of an independent school: Keys to an effective transition

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What is it like to take on the role of principal for the first time? This question has been at the heart of the research that I have conducted for my PhD thesis over the past few years. My interest in this topic came from a concern that I have had for some time for the wellbeing of principals, and a desire to understand the stresses of this challenging role. Over the years, in my consulting work as a psychologist, I have listened to the experiences of principals. I often heard stories of the personal struggles and intense challenges that come with the role of principal, and the way that these challenges were impacting on their wellbeing and personal relationships. I began to wonder what it was like for those stepping into the role for the first time and how to make this transition easier for beginning principals.

My research project studied the experiences of beginning principals of independent schools. Although there has been considerable research undertaken examining the experiences of principals, and beginning principals in general, the experiences of beginning principals in Australian Independent schools has received very little research attention. For this research, data was collected through an online survey; one-off interviews with principals in their first two years in the role; and interviews with eight principals from around Australia who were in their first year in the role of principal.

Through a pre-commencement interview and four subsequent interviews throughout their first year, I was able to look at what factors had helped first year principals prepare for the role and enabled them to make a strong start. I was also able to gain a first-hand snapshot of their joys and challenges in taking on such a demanding role. In this article, I will highlight the main findings from the research in three areas;

1. Keys to helping beginning principals make a strong start;
2. Understanding the greatest challenges faced by beginning principals; and,
3. Developing strategies that encourage personal and professional development and support.

Keys to helping beginning principals make a strong start

Athletes are always keen to make a strong start in their event. Their ability to start well is shaped by their skills, many years of training and preparation, and their focus on the race ahead of them. The start is also influenced by track conditions and other external factors. Similarly, when a beginning principal starts in the role, their ability to adjust, navigate and perform effectively will reflect their abilities, preparation, training, focus and the context in which they are starting.

Overall, the beginning principals in the study were well prepared to make a strong start in the role. Fifteen of the sixteen principals who were interviewed reported a high level of preparedness when they took on the role. This is an encouraging contrast to much of the literature regarding beginning principals in general, which has shown a prevailing feeling of unpreparedness (Belmonte & Cranston, 2009; Bright & Ware, 2003; Lattuca, 2012). The data showed that there were four major keys that helped the beginning principals to make a strong start in the role.

These were:

- effective preparation and training;
- pre-commencement experiences at the school;
- a well-planned welcome, induction and formal commissioning into the role; and,
- strong support from the school board, independent school associations and mentors.

Effective preparation and training

Effective preparation for principalship involves formal and informal training, experiences in various school leadership roles and guidance and support from others (Webber & Scott, 2013). Looking specifically at the principals who were studied more closely throughout their first year, seven out of the eight had master's degrees, with two also having doctoral qualifications. The value of a master's level qualification as part of effective preparation for the role of principal was highlighted in research carried out in the United Kingdom (Sieber, 2002), and is argued by Brundrett, Fitzgerald and Sommefeldt (2007) as being appropriate, as the principal is leading a team of professionals with graduate level education. This research also noted the significance of having an emphasis on business management and leadership in the postgraduate study undertaken. This is important for aspiring principals to consider, as this research indicated that financial, and overall organisational, management was one of the steepest learning curves that beginning principals experienced. As well as these formal channels, the beginning principals had benefitted greatly from their participation in leadership development programmes.

Effective preparation for principals also involves the benefits gained from previous experiences in school leadership. Those taking on principalship have usually previously filled executive team school leadership positions. Often, they have been a deputy principal and this experience has helped to prepare them to be a principal (Bloom & Krovetz, 2001; JohnsonTaylor & Martin, 2007). Previous roles, which have afforded the beginning principal a diversity of leadership responsibilities and experiences, were shown to be the most effective preparation for principalship (Sieber, 2002).

This type of high-level leadership exposure can be contrasted to the experience of some beginning principals in positions in which they only fulfil a narrow band of responsibilities. One of the beginning principals, after sharing her observations that many deputy principals are kept busy with "organising pixifotos" and non-strategic issues, went on to share her positive experience as a deputy principal.

> I was given a lot of autonomy in my role as deputy where I really was standing alongside the principal a lot. People might see that as a waste of time and resources, but it wasn't; it was really for preparing me as an apprentice.

The deputy principal role can be an effective introduction to the role of principal, if it is wide-ranging and provides some opportunities for the deputy to sit in the driver's seat, while serving as acting principal from time to time (Grant, 2013). It is this combination of training and wide-ranging experience that can really help to prepare leaders for the role of principal. The results also showed the great benefit that can be gained from pre-commencement experiences at the school.

Pre-commencement experiences at the school

We all know how difficult the first day in a new job can be! There are new people to get to know, a new community culture to understand and operational procedures with which to become familiar. This research clearly demonstrated that beginning principals are helped to start well if their transition process begins earlier than their official first day in the office. Although there are many variables that can influence how much exposure the incoming principal can be given to their new school, this research showed that these experiences can help the beginning principal to start developing relationships with the school board, leaders, staff and wider school community. As the trust that people have in their leader plays such an important part in shaping their effectiveness (Rath & Conchie, 2008), it follows that if the beginning principal can start gaining the trust of the staff before they commence in the role, this will enable them to hit the ground running.

The principals in this research enjoyed different levels of exposure to their new school which ranged from social events, meetings with the school leaders and staff, and active involvement in decision making, right through to spending significant periods of time at the school and working with the outgoing principal. The greatest benefits of this pre-commencement time at the school were reported by two of the principals who were given opportunities to spend extended time at the school. One had spent one week per month at the new school in the months preceding her official start and the other had been given the opportunity to spend an entire term full time at the school with considerable time spent shadowing the principal. Shadowing can enable the preparing principal to gain a wealth of practical information and insight about the school (Walker, Bryant, & Lee, 2013). For this principal, opportunities were also given for him to shadow twelve other principals;

> I'm shadowing the current principal, or outgoing principal for that time. Probably in reality about 30% of the time I shadow him. The other time I used to do a variety of things, meet with key staff and I've visited a number of other principals and shadowed them... So, I feel very well prepared because of what I've done. I think that shadowing twelve different Heads for a day, or two days in some cases, has been wonderfully good preparation.

Both this principal and the other, who spent one week each month with the outgoing principal, expressed the great advantage that these experiences had given them in starting well. Both started in the role knowing all staff names and having a strong relational foundation with the new community.

Although the importance of succession planning and transitioning is well accepted and researched in the business

sector, in the school context it is largely unexplored (Steyn, 2013). Garchinsky (2008) argued that succession in the school context is often focused on the incoming leader, whereas in the business sector the role of the outgoing leader is emphasised as it helps to create a smooth transition.

For those in the process of becoming a beginning principal, and for the boards and existing principals of these schools, there is a great opportunity afforded by pro-actively planning precommencement time at the school. This time can significantly help the beginning principal to become accustomed to the new context, as well as helping the school transition smoothly to a new leader.

A well planned and effective welcome, induction and commissioning into the role

The commencement of a new principal is an exciting time for the principal and the whole school community. The psychological importance of the welcoming process and formal commissioning service should not be underestimated. For these principals and their families, it is a time of celebration and validation of the journey thus far, and a conferral of trust for their future leadership.

Formal commissioning services provide an opportunity to publicly welcome the beginning principal and show the school's support and excitement about their appointment. As approximately 84 per cent of Independent schools in Australia are associated with a religious denomination or church, predominantly from the Christian faith (Caldwell, 2010), these commissioning events can be quite large and significant. These formal services or events should not be simply perfunctory but an important part of a strong start in the new position.

One aspect that can sometimes be overlooked is the practical induction process for the beginning principal. Although the welcoming process went well for the principals that were interviewed, some experienced frustrations because of a "here are the keys" approach to induction. It can be frustrating when inadequate induction is given to the practical workings of the school or there are no support staff available when the principal starts.

> No one thinks about the induction of a principal. I would have liked more; it would have been nice even for a couple of the board members to come in. The only people here when I

> started were the maintenance guys and they were fantastic... I could sense very early that there wasn't anything in place that should have been in place. Even keys, computers, all of those little things; I should have had a number of staff there when I started to take me through instead of having to find out for myself.

The welcoming of a new principal involves announcements, events, as well as much needed practical orientation to the school community and facilities.

Strong support from the school board, school associations and mentors

The role of the school board in helping a beginning principal to start well and continue to function effectively emerged as one of the most consistent themes in this research project. School boards play a vital role in the healthy governance of independent schools. Strong boards were comprised of individuals who have a high degree of independence, competence and commitment (Monks & Minow, 2011).

The effectiveness of the board is also influenced by the health of the relationships within the board and between the board and the beginning principal. Unhealthy relationships between the board and the principal can cause the beginning principal considerable angst and lead to a diminished sense of care and support (Dewa et al., 2009; Gannell, 2004). In particular, the relationship between the beginning principal and the board chair is crucial, as a mutually respectful and productive relationship between these two individuals provides encouragement and support for the principal and helps build healthy dynamics within the board itself (Guerrero, Lapalme, & Seguin, 2014). As one of the principals shared:

> In independent schools, your Chair at Council is probably your only real friend. And that person can actually sack you. In my case, with a weeks' notice, you can go and just be fired... Of course, the council hired me, and they can sack me. [Laughs] It's a pretty important relationship to have right.

In all but one instance, the beginning principals who were interviewed enjoyed a positive and productive relationship with their boards, an essential ingredient to making a strong start in the role. The influence of the school board on the beginning principal's wellbeing and confidence was demonstrated in the case of one of the principals who had a strained relationship with his board chair and with the board during his first year. Instead of receiving encouragement and support, conflict with the board chair had a detrimental impact on his experience. This principal openly shared his frustrations and disappointments concerning his relationship with the board chair.

> His key role shouldn't be to control, it should be to lead. When he's leading, he would be asking how I am going, he would be concerned about my wellbeing and looking to strategically utilise my skills rather than trying to run his own agenda.

In light of the tremendous impact that the school board can have on the functioning of the beginning principal there should be a commitment to recruiting board members with adequate expertise, and to building healthy, functional team dynamics within the board, and between the board and the beginning principal.

The beginning principals were also helped to make a strong start through the help of independent school associations. The principals in the study spoke very highly of the support that they had received from various associations of independent schools. Independent school associations can provide the beginning principals with access to professionals who can offer much needed advice and support on various aspects of school functioning. One principal described this relationship as a "phone a friend" lifeline, and all principals in the study shared very positive feedback about their state associations. One shared this about their state independent school association:

> ISV (Independent Schools Victoria) are fantastic. I've rung them to speak to different staff members, to get their opinion, or their advice; so they've been terrific. So I don't feel like I'm isolated, but I do think that if I didn't have those connections it would be a terribly isolating job. I think it's really important to have a network of people that you can call on.

There was an overwhelming appreciation expressed by the principals who were interviewed of the high level of professional support that they had received from these organisations, the training courses on offer, and help that they had been given in linking up with a mentor. Independent school associations offer vital support and guidance which helps beginning principals to make a strong start in the role.

Another vital area of support for beginning principals is through the friendship and mentoring offered by other principals. Mentoring can assist the beginning principal in the development of their professional identity and leadership skills, while providing personal support (Daresh, 2004; Parylo, Zepeda & Bengston, 2012). Mentors can help the beginning principal as they can understand the challenges that they are facing, as reflected in this comment:

> There are few people who know what the job looks like, what the opportunities in it are, and can sympathise with you on the whole pressure of it.

For beginning principals to start well, it is also important that they understand and successfully navigate through the challenges that come with the role. In this next section, I will share the findings regarding the most challenging aspects of being a beginning principal.

Understanding the greatest challenges faced by beginning principals

Becoming a principal is both an exciting and daunting experience. There is consensus in the literature that the role of principal has become increasingly challenging in recent decades. With new tasks, responsibilities and accountabilities being added to the role while seemingly nothing is being removed, the role of principal has become

increasingly complex and demanding (Eckman, 2006; Fink, 2010). The increasing accountability for educational outcomes, the growing marketisation of education, increased responsibilities in legal compliance, risk management and the challenges of technology leadership have been just some of the drivers resulting in the intensification of the principal role (Butland, 2008; Lock & Lummis, 2014; Styron & Styron, 2011). Although there has been a concerted push to encourage the distribution of leadership within schools, there is still a prevailing expectation of the "super principal" who is seen as the focal leader, charged with leading the school into a brighter future (Eckman & Kelber, 2010; Garrick, 2010; Mulford, 2008).

There is a growing concern for the impact of these challenges on the wellbeing of principals. In Australia, the *Principal Health and Wellbeing* longitudinal research project has been examining the wellbeing of principals and deputy principals and has found that;

> ...collectively principals and deputy/assistant principals score less than the general population on all positive measures (selfrated health; happiness; mental health; coping; relationships; self-worth; personal wellbeing index) and higher on all negative measures (burnout; stress; sleeping troubles; depressive symptoms; somatic stress symptoms; cognitive stress symptoms). (Riley, 2014a, p. 14).

These results are consistent with other literature that has examined the deleterious effects of the stresses and challenges of the role on the wellbeing and personal relationships of principals (Green, Malcolm, Greenwood, Small, & Murphy, 2001; Phillips, Sen, & McNamee, 2007). The challenging nature of the role of principal could be discouraging other school leaders to aspire to this position (Oplatka & Tamir, 2009; Thomson & Blackmore, 2006).

As beginning principals move into the role, they accept responsibilities in both pedagogical and organisation leadership right from day one. It is not surprising that beginning principals find the transitioning process quite stressful and possibly traumatic (Garcia-Garduno, Slater, & Lopez-Gorosave, 2011; Weindling & Dimmock, 2006). There has been considerable research effort placed on attempting to identify the key challenges that beginning principals face.

In a systematic review of the literature in this area, Earley et al., (2013) found that beginning principals from around the world experience similar challenges. The list of these challenges is quite daunting. For the survey component of this research, I gathered together many of the challenges that had been reported in previous research. There were 51 items which the respondents were asked to rate in terms of how challenging they had found them. In addition to the 51 items, another 30 were identified in the interviews. Even this list of 81 items is not a complete list of the challenges faced by beginning principals, although it is exhausting to contemplate. One of the aims of this research was to identify the most common challenges faced by the principals in the study. The data showed that the most challenging aspects of being a beginning principal were:

- the intensity of the role;
- staffing issues and the development of a strong executive team;
- understanding the culture of the school community;
- enrolments and finances; and
- dealing with critical incidents.

In the following sections, I will focus on highlighting the results regarding the first two of these challenges, as they were clearly shown to be the most formidable aspects faced by the research participants.

The intensity of the role

This research project showed that the greatest challenge faced by beginning principals is the sheer magnitude and intensity of the role. This finding was consistently present in all phases of the research project. The main contributing factors leading to this intensity were the extremely demanding workload of being a principal, the weight of responsibility and the challenges that come from being a public figure.

The demanding workload: Beginning principals can be challenged by the volume, diversity and unpredictable nature of their role (Spillane & Lee, 2014). One aspect of the workload is the long hours that principals need to work (MacBeath, 2011; J. Walker, 2009). Although the beginning principals in the study had been exposed to long work hours through their previous leadership roles, some concerns over these work hours did emerge. One concern was that of sustainability.

> That will be fourteen weeks straight at work; perhaps somewhere between sixty-five and seventy hours a week. So there have been some public holidays that I have worked. I need to take a break for personal health and also for family relationships and the like. I think for me, personally, workload issues are a significant issue this term. The workload is not sustainable.

Another principal commented "I'd be hard pressed to get it lower than 70. I can't maintain it at this level". The long work hours and demands placed on principals is leading to deleterious effects on their wellbeing (Riley, 2014b). There is a real risk that for some of the beginning principals these work hours will not be sustainable and possibly lead to burnout in the long term. For some of the beginning principals the main concern was not with the hours that they worked, but the sense that even with those hours they had not completed the work that had to be done. The following comments highlight this frustration.

> I'm okay to work 75 hours a week if I think I could sort of complete the work, but I have over 700 emails sitting in my inbox. I've read them all — and I trash and delete as I go — so that's 700 that I've had to keep in order to either remind me to do something; or I've got to ask a question. I think it's a simplistic view to talk about hours because there are a lot of hours in the job, but you can't complete it within those hours. So if I could go home and say "I've done 70 hours this week, but I'm up-to-date with my emails, I'm up-to-date with this, I've done the reading, I've been to all of these events, fantastic", I think that would be much more do-able.

More than the number of hours worked, the intensity of the workload was fuelled by the emotional and physical energy that it exacted from the beginning principals. The work is emotionally taxing. As one of the principals commented "I don't think you can prepare for the emotional side of it". There is an emotional component to most of the decisions and problems that the principal is required to deal with on a day to day basis. With each interaction the principal needs to tune into the person and issues at hand and respond appropriately. Another principal commented "Stress is just immense; it's just sickening sometimes. There are moments when you cannot breathe because it's so stressful". And another shared this sentiment; "I think burn out can actually come from emotional anxiety and strain as much as the workload".

The emotional nature of the role is heightened at times when a critical incident occurs within the school. Thankfully these are infrequent, but when they do occur, they can take an enormous emotional toll on the principal. One principal commented on the effect of such an incident on his wellbeing;

> It's been tough. Probably the last four weeks have been horrendous. It has knocked me around enormously in terms of sleep, in terms of anxiety; I haven't been exercising anywhere near as much as I was. I really feel beaten around the ears at the moment.

Working through critical incidents means that the principal is communicating with students, staff, the school community and often the media (Barron Ausbrooks, 2010). Principals, while dealing with their own emotional response to the incident, are expected to take on a leading role as the school processes and recovers from the events (Tarrant, 2014).

For principals it is not only the types of issues that they deal with that can be emotionally draining, but also the effort required to maintain appropriate emotional responses to students, staff and parents. The term "emotional labour" was coined by Hochschild over 30 years ago and refers to labour that "requires one to induce or suppress feeling in order to sustain the outward countenance that produces the proper state of mind in others" (Hochschild, 2012, p 7).

Certainly, this type of emotional labour reflects the role of principal as they are often required to suppress their real feelings and to present an acceptable response to whoever they are speaking with.

As well as being emotionally draining, being a principal is also physically draining. The principals talked about the sheer physicality of the role, which required great stamina and could leave them feeling "absolutely exhausted".

The weight of responsibility: The intensity of the role was also influenced by the great sense of responsibility that the beginning principals felt from day one. Although all the principals that were interviewed throughout their first year reported, supported and practised some form of distributed leadership, there was still a great sense of the "buck stops with me", as reflected in these two comments;

> I think that the biggest challenge is everything; the "buck stops with you" with everything. So, no matter what is happening across the whole school, if something goes wrong it's going to impact on you as a principal.

> I think the biggest challenge is having a good overall oversight of the entire school, and this is a school with three campuses. I knew it would be hard. I mean, it's just that you've got the weight of the world on your shoulder sometimes, and you worry about things and how things are going to work out. There is constant pressure that is always there. You are the one that is responsible in the end for the final decision, and it is relentless.

In a recent study of beginning principals in Chicago, Spillane and Lee (2014, p. 444) found that the deep sense of responsibility was the major challenge faced by beginning principals and that:

> "with their sense of ultimate responsibility came increased stress, a constant alertness to what might go wrong, and an inability to leave the job behind even on weekends. This stress was manifest in novices' reports of things such as sleep loss, physical exhaustion, frustration, nervousness, and constant worrying".

Principals are responsible for the organisational and educational leadership of a large school community. One principal shared the added responsibility that a principal has when compared to a company Chief Executive Officer (CEO):

> I think the biggest challenge — is as a leader, you're like a CEO. It's a 26-million-dollar business; you're running the business. You have got all the things that happen when you're a CEO, but as a principal you've actually got another form of leadership; so, you're doing transformational leadership and you've got something called instructional leadership. I'm meant to lead the education process in this school.

This overarching sense of responsibility can create an ongoing pressure in the life of the beginning principal, and can also lead to them being excessively worried about things happening in the school, that they don't even know about or have much direct control over. This sense of responsibility is also exacerbated by the public nature of the role that they occupy.

Being a public figure: The third contributor to the intensity of the role was the public nature of being the figurehead of the school community. As the overt face of the school, the principal's life is very much in view. They are a role model to others and open to scrutiny. As one principal shared:

> Everything is public. I guess had you had a more anonymous job, you'd be able to deal with things differently. Especially when I have just been put up as a particular package. You need to protect the integrity of the office because, whether you like it or not, you are a role model and these people bought the package.

In schools with a religious affiliation, the principal is also called to demonstrate "faith leadership", which for many is a real privilege, but also can bring its own pressures and

expectations. This public leadership also places pressure on the beginning principals to be circumspect with their words, as some felt that every comment they made was taken as a "dictum of law".

Ironically in senior leadership positions, although the leader interacts with a huge number of people, the nature of their role can leave them feeling lonely and very isolated (Izgar, 2009).

> I have had a couple of moments where that feeling has been quite overwhelming ... I think probably the most confronting thing of all is; early in term two is just the reality of how isolated you really are in the position.

This sense of loneliness and isolation is not confined to principals as it is also well documented in the corporate world (Saporito, 2012). Research has shown that beginning CEOs can be the most susceptible and that this has a negative effect on their overall performance (RHR International, 2012). This sense of loneliness is another reason why support and mentoring from other principals is so crucial.

With the combined influence of the workload, the sense of responsibility and the challenges that come from being in a senior leadership position, the intensity of the role is by far the most challenging aspect of being a beginning principal. This research identified another aspect of the role that the beginning principals found very challenging. This was dealing with staff issues and building leadership teams.

Staffing issues and the development of a strong executive team

Beginning principals face the challenge of leading their staff team, which can often be quite large. This involves getting to know staff members, showing care and support, helping them to resolve conflict, facilitating staff development and being involved in performance management issues. Beginning principals are often faced with the stress of dealing with underperforming staff. It can be challenging to work with underperforming staff, as this principal shared about the greatest challenge that he was facing;

> The most ongoing one I'm dealing with that's difficult is underperforming staff. I think that's definitely at the top and speaking to other principals in their first year, they would probably say the same.

Dealing with performance issues can be more challenging if the school has not previously had appraisal systems in place, as one of the principals shared "part of the structural issue is that we haven't had an appraisal system operating; people are not used to being held accountable".

In addition to performance issues, beginning principals find themselves spending time and emotional energy involved in conflicts between staff members, and responding appropriately to staff members who may oppose the beginning principal's change initiatives.

The school's executive leadership team play an important role in the leadership of the school and in distributing the weight of leadership responsibilities from the beginning principal. When beginning principals start in the role, they start with an existing executive leadership team. One of the challenges that they faced was ensuring that the executive team was comprised of leaders who are functioning effectively. One principal shared his frustration with this process;

> Staff management is the big one. It's particularly the executive staff leadership. [sigh] You step into a team that you haven't built, but they're the ones that you have to work with while trying to establish a relationship, trying to work out where people's respective strengths and weaknesses are; trying to come to understand the various histories and networks and connections that are there in the background. It takes time to get into that head-space.

This challenge is similarly faced by CEOs of corporate organisations, as research has demonstrated that new CEOs are often hesitant to make changes in their senior leadership team, and often simply accept that the team members will continue in their role (Wageman, Nunes, Burruss & Hackman, 2008). Principals have a great need for an effective and cohesive leadership team and the beginning principals did struggle at times to create a strategy, and the timing needed to deal with executive team members that they considered to be underperforming.

These challenges can be difficult to navigate. On one hand, the beginning principal is in a phase in which they are seeking to build strong relationships with their staff. On the other, at times, they can very quickly see that the quality of the leadership of some team members is holding the school back from reaching its potential.

As well as the intensity of the role and dealing with staffing issues, the beginning principals also reported the challenges involved in understanding the culture of the school community, enrolment and finance issues, and responding to critical incidents. It is important for aspiring principals, beginning principals and their boards to understand the challenging nature of this role and to put in place strategies to help the beginning principals to successfully navigate these issues. The following section will look at some strategies that can help beginning principals face these challenges and to thrive in the role.

Developing strategies that encourage personal and professional development and support

It is clear from this research that becoming a beginning principal can be a very challenging experience. It is important to ask, what are some strategies that could be put in place to foster continued growth and development in beginning principals? Seven strategies come to light as a result of this research.

Beginning principals to:

- keep the rewarding nature of the role in focus;
- work towards being an effective principal rather than a "super principal";
- develop a greater level of resilience;
- build a personal support structure through

mentoring, coaching and the friendship of other principals;
- fully utilise support structures, courses and conferences that are on offer through independent school associations.
- School boards can also help if they; emphasise the importance of a healthy board-principal relationship and become more aware of the challenges faced by beginning principals. Then, in conjunction with their beginning principal, create additional support in the areas that are particularly challenging for the principal. There is also a wider call for education systems, governments and the wider community to
- understand the drivers for the intensification of the role and find ways of reducing these external pressures.

Keeping the rewarding nature of the role in focus

This research project found that despite the challenges, beginning principals were greatly encouraged and strengthened by the rewarding aspects of the role. All principals interviewed commented on the many rewarding aspects of the role, and the diverse and demanding nature of the role was something that they really appreciated. The following comments are representative of all the principals interviewed;

> Professionally, even though this job is so terribly difficult, it's challenging and it changes every day and I really like that, so I don't imagine myself doing any other job. I really love this job.

> Is this the best job I've ever had? I'd say, yes it is. I couldn't be happier; I just love the job. If you said to me today that I could never do this job again, I would be devastated.

> The job is fabulous, and I am not sorry I took it for a minute ... best job in the world.

Previous research projects have also shown that, despite the difficulties, principals in general experience a high level of job satisfaction (Darmody & Smyth, 2011; Shoho & Barnett, 2010). For instance, research encompassing over a thousand Victorian secondary school principals found that 90 per cent reported a high sense of job satisfaction and considered it a great privilege to be a principal (Saulwick & Muller, 2004).

The results of this current project showed that the greatest rewards of being a beginning principal were found in the opportunities to build relationships with students and seeing them grow, working with the school staff and helping them to develop, and being able to make significant decisions and influence the vision of the school.

Making an impact on the lives of students emerged as the most rewarding aspect for beginning principals. This has also been found consistently in other research (Bass, 2006; Saulwick & Muller, 2004; Shoho & Barnett, 2010). In contrast to a classroom teacher, the beginning principal has more opportunities to interact and influence students from all grades of the school. It is this interaction and influence on students, albeit often indirectly, that can give the principal a great sense of purpose and satisfaction.

> Working with the kids is fantastic; anything to do with them is great and just things that they are involved in. The best things are when the kids have performed or done something and I've been able to go and watch. The school play, music soiree, those sorts of things... they're the best things, when you actually see the kids in action. That's when you really feel good. The best thing is the relationships I have formed with the kids.

Beginning principals also greatly appreciated the opportunity to work with their staff teams and to play a part in their professional development. Particularly encouraging was seeing staff, they had appointed, doing well in their roles.

> The people that I have employed, I've just been tickled pink that they're absolutely the right kind of people, and that's exciting because you just feel that it's helping the other staff that they're working with; it's lifted the expectations of the school; it's meant that the teaching is happening to a higher degree, which means that I feel confident that the children are learning, so those things are the sorts of things that make me happy.

The third reward that the principals reported was that they enjoyed being in a position to make significant decisions and influence the shaping of the school's vision. This sentiment is typified in this comment;

> Feeling like you have got the influence and the capacity to make things happen. I think that has been probably the highlight of it all. So, really working hard to build a strategic plan and starting to see some of those goals come to fruition as well.

In the midst of the challenges, beginning principals have many rewarding experiences from which to draw strength and inspiration. Beginning principals would be served well by keeping these rewarding aspects in focus and maximising their time in these areas. As Pink (2010) argues, noble purposes serve as the greatest long-term motivating force and "so the noble purpose of education and making a difference in the lives of students, staff and families can serve as the fuel to sustain the beginning principal".

Working towards being an effective principal rather than a "super principal"

Beginning principals should be encouraged to reach their potential and be comfortable with their own leadership style, rather than feel pressured into fulfilling the "super principal" persona.

I believe that the elements that can help principals to be effective are:
- being comfortable with their own style,
- having realistic expectations of themselves.
- learning to live with an unfinished job, and
- building strong teams.

Each principal will serve in the role reflecting their strengths, abilities and pedagogical preferences. Instead of expecting them to be all-rounders and totally

talented in every aspect of school leadership, they should be encouraged to understand and utilise their strengths and leadership style (Rath & Conchie, 2008). As well as the pressure of the expectations of others, individuals can also place a great deal of stress on themselves with the expectations they create of their own performance. Beginning principals should be encouraged to have realistic expectations of themselves and, just as they often tell their students, be happy that they have done their best. Also, with a job that will never be 100 per cent complete, it is important to learn to live with that tension, and develop greater skills in task prioritisation, ensuring that the most important aspects of the work are covered.

In this day and age of increasing organisational complexities, senior leaders of any type of organisation will need to work hard at developing strong teams. As Wageman et al. (2008) rightly suggests;

> The demands on those who occupy the top roles of contemporary organizations are rapidly outdistancing the capabilities of any single person, no matter how talented.

These attitudes and ways of working will help the principal to not succumb to the unrealistic pressures and expectations placed on them by the outside world, and often by themselves.

Developing a greater level of resilience

Resilience is one of the most important leadership attributes that a principal can have (Notman, 2012). From the following comment on the nature of resilience by Steward (2014, p. 54), it is easy to see why resilience is essential for beginning principals to develop.

> Definitions of resilience include references to persisting in the face of difficulty; maintaining hope against the odds; being optimistic; being courageous; having inner resourcefulness; showing the capacity to recover quickly from setbacks; having moral purpose.

Resilience helps the leader to learn from, as well as survive, the challenges that they will invariably face (Patterson & Patterson, 2009). Unfortunately, very little research has been conducted which explores how principals can develop a greater degree of resilience (Lazaridou & Beka, 2014). Although resilience can reflect existing personal traits, there is also a sense that it can be developed through life experiences, selfreflection, mentoring and training courses (Cameron & Brownie, 2010; Notman, 2012).

Building a personal support structure through mentoring, coaching and developing friendships with other principals

As mentoring has been shown to help support, encourage and provide guidance for beginning principals, it should be a priority and a necessary part of being in the role. In addition to mentoring, many beginning principals would benefit from coaching, which is more goal specific and performance oriented offered by professional coaches, rather than experienced principals who are mentors (Bloom, Castagna & Warren, 2003). Coaching can help the beginning principals navigate the greatest developmental challenges that they are facing. This research has also shown that networking, and developing friendships with other principals are highly beneficial. As the position can be lonely and isolating, beginning principals should develop and maintain these personal support structures.

Fully utilise support structures, courses and conferences that are on offer through associations

The role of associations in the support of the beginning principal should not be underestimated. To their credit, these organisations are performing a much appreciated and vital function in providing professional advice, training courses, conferences, and assistance connecting with mentors. There was a unanimous sense of gratitude for these organisations, and all beginning principals should be encouraged to fully utilise the assistance offered by these associations.

The school board role

The board can emphasise the importance of a healthy board-principal relationship and become more aware of the challenges faced by beginning principals. Then, in conjunction with their beginning principal, create additional support in the areas that are particularly challenging for the principal.

School boards have a legal and moral obligation to function effectively and provide support to the beginning principal. The board has a duty of care to empower and assist the principal, and to respond to the struggles that the principal is facing. There should be a strong and consistent emphasis on the board developing healthy team functioning, an awareness of the challenges faced by the beginning principal and willingness to assist and create support for them. The school board can be one of the greatest helps or hindrances to the effective functioning and wellbeing of beginning principals. Boards are perfectly placed to offer immediate and effective support in the challenges that principals are facing. Boards can increase their supporting impact by familiarising themselves with the common challenges, making sure that someone is watching out for the principal and their family, and creating an authentic atmosphere in which the principal can be honest and open about their struggles.

Education systems, governments and the wider community need to understand the drivers for the intensification of the role and find ways of reducing these external pressures.

The intensification of the role of principal is something that is driven by many external forces. In the context of an awareness of the negative impact of the challenges faced by principals, there is a growing call for action to be taken to respond to the excessive work demands placed on them (Riley, 2014a). It would be easy to simply normalise the workload and stresses as "par for the

course" for any principal. However, this would mean that the situation will only grow worse, and initiatives designed to de-intensify the role would not be forthcoming. Considering that we are talking about the wellbeing of principals and their family relationships, the status quo is unreasonable. This is a big picture problem which will need to involve education systems, the government, parents and the greater community striving together to make the role of principal more doable and sustainable.

Final words

Becoming a principal is an extremely rewarding and challenging experience. A smooth transition into becoming a principal is built on the foundation of many years of preparation through courses, and gaining a wide range of leadership experience within schools. The skills and knowledge gained through this preparation can be supplemented by ongoing training, mentoring and support from independent school organisations. There is also a vital role that the school board can play in enabling the principal to make a strong start and continue to feel supported and encouraged through the years ahead. All that can be done to support beginning principals should be done, as they play such an important role in the education of our youth. We can all ask ourselves, what are we doing to encourage and support the principal of our school? ▲

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Why understanding mental health is important for boarding schools

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I just wanted to let you know [name of student] has started a medication called [name of medication]. He had a mental health assessment done yesterday. He has tried to overdose twice and has been cutting himself. I would really like for [name of student] to see you and was wondering if at all possible I can make an appointment with you this coming Monday morning. (Parent email to school psychologist, 2018).

Mental ill-health is a significant issue affecting an estimated 10–20 per cent of school-age children and adolescents across Australia. It is typically present before the age of 25 years, with half of all mental health problems starting before the age of 14, although such problems are often not obvious or diagnosed until much later. Suicide remains the leading cause of death for young people aged 5 to 17 years, with rates of attempted suicide and self-harm among the highest of all age groups. Kids Helpline data for example, reveals that children as young as 7 years old are making contact about experiencing suicidality, with numbers substantially increasing between the ages of 11 and 14. Of particular concern, Australian Bureau of Statistics (ABS) data, related to suicide deaths of children and adolescents, clearly shows that Aboriginal and Torres Strait Islander young people are overrepresented, a fact sadly emphasised by the recently released Western Australian Coroner's Report into the deaths of 13 young Aboriginal people in the Kimberley Region. Starkly, it found 12 of the 13 deaths were by suicide, and reported that five of the 13 deaths investigated were of children aged between 10 and 13 years.

While awareness of the mental health of children and adolescents has grown, several studies have repeatedly shown that less than a quarter of Australian school-age children experiencing mental ill-health have accessed any professional help, with even fewer receiving support from specialist child and adolescent mental health services. This is arguably one reason why there has been little change in prevalence rates over time. Notably, children aged 14 years or younger are significantly less likely to receive help than older adolescents aged 15 to 19 years. Data specifically relating to help-seeking by Aboriginal and Torres Strait Islander young people is almost non-existent. There is no doubt however, that schools play an important role in supporting students experiencing mental ill-health. Research has shown that education providers often act as key gatekeepers for the referral of students to specialist child and adolescent mental health services. Furthermore, teacher identification of mental health difficulties significantly increases the likelihood that children and adolescents engage with early intervention programmes.

Adolescence, mental health and secondary schooling

The onset of mental health problems typically coincides with the transition from primary to secondary schooling and the beginning of adolescence when young people are aged 11–13 years of age. From a developmental perspective, this is a time of substantial change and foremost associated with puberty (on average by age 10 in females and age 12 in males). Multiple studies have shown that a cascade of neurobiological processes takes place during adolescence, including but not limited to sexual maturation and pronounced hormonal, metabolic and physiological change. Increased motivation and sensitivity towards social connectedness with peers, social roles and

intimate relationships, status and prestige are also common. From a psychological perspective, a shift from concrete to pre-abstract thinking skills becomes more evident, as does the desire to exercise other innate psychological needs, such as: (1) competency (for example, the need to control one's own outcomes and experience a sense of mastery), (2) autonomy (for example, the need to be causal agents in one's own life), and (3) relatedness (for example, the need to connect with and form relationships with others). Hence, it is important for schools to keep in mind that, rather than 'storm and stress', adolescence is more often viewed as a critical inflection point and time to invest in young people when seeking to forge healthy human development across the lifespan.

Still, emotional disorders such as anxiety and depression are among the most common mental health concerns in adolescence. They can manifest as irritability, withdrawal from usual activities and a decline in academic performance. Eating disorders also typically onset during adolescence and are more prevalent among girls than boys. Restrictive eating, binging and purging, and excessive exercise may indicate that a student is at risk of an eating disorder. Both suicidal thoughts and non-suicidal self-injury (NSSI), deliberate damage to one's body without suicidal intent (for example, burning or cutting body tissue) are common during adolescence. One in five adolescents report NSSI as a means of regulating intense or unwanted emotional distress, and to gain relief from feelings such as anger, anxiousness, emptiness, guilt and sadness. Despite misconceptions, NSSI is not more common among girls than among boys but does typically onset prior to 14 years of age. Although being engaged without suicide intent, research confirms that self-injury is the most reliable predictor of later suicidal thoughts and behaviours. Globally, suicide is the third leading cause of death among young people aged 15–19, and attempts are much more common among girls than boys.

The boarding school context

When we consider mental health within the context of boarding school, it is important to recognise that the majority of new students arrive with self-regulation and problem-solving capacities that mirror their developmental stage in life (for example, late childhood to early adolescence) and the environment they have come from (for example, parents/guardians and primary school). Growth in these capacities and other life skills (for example, help-seeking behaviours) have some roots in maturation, but evidence emphasises they are best nurtured through responsive parenting and within the nexus of supportive family relationships characterised by warmth. While not all families may exhibit these characteristics, the salient implication to keep in mind with new boarding students is that with little or no preparation prior to transition, they are expected to routinely spend substantial periods of time dislocated from this source of support. What is more, no study to date has yet provided a comprehensive understanding of the mental health needs of new boarding students during this formative time or across the boarding school experience as a whole. Likewise, how young people with mental health problems manage the experience of schooling away from primary caregivers and home or how this may possibly contribute to mental ill-health (for example, what risk and protective factors may apply), all warrant further research. Indeed, the existing evidence base available is at best both scant and patchy with the majority of studies underpowered (for example low participant numbers) or limited by design and methodological problems.

Some researchers have discerned that few significant gains or declines in psychological wellbeing occur between boarding and non-boarding students across a single academic year. Further modest positive personal growth, as measured by increases in life satisfaction, sense of meaning and purpose, as well as improved child-parent relationships, have been linked with attending boarding school. Yet, other research suggests by the end of Year 8, boarding students are more likely to report significantly higher levels of anxiousness and stress than non-boarders. Of concern, a spike in the frequency of bullying perpetration has also been shown to occur after the transition to boarding school, with an increase in bullying perpetration continuing into the following two years. Research in this area has associated boarding status with reporting higher levels of anxiousness and stress and with a greater risk of bullying victimisation at the beginning of Year 8. Likewise, those boarding students who self-reported symptoms linked with conduct problems and emotional difficulties were likely to engage in bullying perpetration more frequently. A greater proportion of male boarding students report frequent bullying perpetration when compared with female boarders. And when contrasted with males at the end of Years 8 and 9, female boarders were less likely to report symptoms associated with conduct problems and more likely to report significantly higher peer support and prosocial tendencies. Tentative as such findings are, they are not trivial and require close consideration. Bullying at boarding school, for example, has been linked with physical, emotional and sexual abuse, complex psychological distress, and lifelong trauma (see https://www.childabuseroyalcommission.gov.au/schools).

What is known, even if predominantly anecdotally at this point, is that while the majority of boarding students seemingly adjust to schooling away from home and may display indicators of positive mental health, this is not a universal experience had by all. In light of this, it seems responsible to adopt the stance that mental

health problems in boarding students are likely to be underestimated, underdiagnosed and undertreated. This issue is not just poorly understood at the population level but also notably in terms of how it impacts on young people while they are away from the support of their primary caregivers (for example, parents/guardians), how it presents during different stages of adolescence (for example, early versus middle), and between male and female boarders. Equally, how it may present in students from culturally and linguistically diverse backgrounds (for example, Aboriginal and Torres Strait Islander students) as well as within other groups such as students with a disability, remains an open question.

How to talk to students

One thing that we know is that students' sense of connection with teachers predicts their sense of connection with schooling. The teacher-student relationship also remains one of the most robust predictors of students' sense of safety and well-being at school. Yet, research shows that talking to young people about mental health concerns can be challenging for school staff, especially for those staff without training in mental health. Several awareness raising campaigns and numerous school based mental health programmes have tried to address this in recent years, however a deep stigma still surrounds mental illness, and is particularly associated with behaviours like suicide and NSSI. The evidence base continues to emphasise that if concern exists for the mental health of a young person, it is always much better to say something than to say nothing at all. How staff in schools respond to students with mental health concerns has been shown to make all the difference in how supported students feel and, crucially, how likely they are to seek help in the future when feeling distressed. Acknowledging the reality of mental distress can help young people prepare to engage with the appropriate mental health service.

The importance of appropriate verbal and non-verbal communication skills cannot be understated, if staff in schools are to engage in a meaningful way in conversations with young people about mental health. Respectful curiosity that acknowledges the student as a whole person and not defined by a mental health problem, foremost extends dignity and empathy, and is more likely to elicit comfort to engage in an open and honest conversation about their specific needs. Stereotypes and euphemisms for mental ill-health remain common within wider society (for example, crazy, mad), however they should similarly be avoided during conversations, as this may create misunderstandings and undermine trust. Indeed, the language used by staff can go a long way to reducing stigma and promoting an inclusive school culture. An important part of reducing stigmatisation is the use of person-centred language (for example, not: borderline, depressive, self-injurer, cutter) and avoiding value-laden labels (for example, maladaptive coping). Those school environments that are responsive to the mental health needs of young people, create safe spaces where students can talk, express themselves, and importantly feel heard, are most likely to foster resilience and empowerment among students. If a student autonomously approaches a staff member to share a mental health concern, take it seriously. Honour the moment by ensuring privacy and actively attend. This means listening empathically and carefully trying to understand the lived experience of the student and make sense of their feelings and concerns from their perspective. During this time, always keep in mind that rather than offering false hope, it is okay to acknowledge that you may not have all the answers and things might take time to sort out.

TABLE 1: FIVE THINGS TO REMEMBER WHEN TALKING WITH A STUDENT ABOUT THEIR MENTAL HEALTH:

1. Don't be afraid to broach the topic of mental health if you are concerned about a student.
2. Be aware of your own reactions, and ensure you adopt a non-judgemental and non-stigmatising attitude.
3. Be empathic and listen to what the student has to say.
4. Focus on what the student needs right now.
5. Check in, now and then, to see how a student is going, but don't over-monitor.

How to broach support with a student experiencing suicidal feelings and thoughts, arguably presents one of the most challenging experiences for staff in schools. However, if you are concerned for a student's immediate safety and well-being, choose a suitable time and ask them directly: 'Are you thinking about suicide?'. This gives the student the chance to talk about how they are feeling and provides you with an opportunity to encourage the student to see the school psychologist or other appropriate mental health service. Likewise, many staff in schools fear that talking about NSSI will lead to 'contagion'. While some students get the idea to self-injure from friends, the vast majority self-injure in private and don't tell anyone. Still, when talking about self-injury in school groups it is best to discuss it in terms of one of several strategies people might use to cope with stress and avoid detailed descriptions (or images) of the behaviour itself. Shedding Light on Self-Injury (see https://www.self-injury.org.au) is a one-stop-shop of information and resources about NSSI, specifically designed for parents/guardians, schools and young people. It includes links to online training, as well as templates for school wide policy and guidelines. Headspace also offers schools a number of useful resources

that destigmatise suicide which are specifically designed for schools (see https://headspace.org.au).

In short, if a student is at high risk of harm to self, or harm to others, manage the immediate risk and your duty of care requirements to them and others. Keep calm and if possible, talk with the student about your concern for their well-being, as well as your duty of care to them and limits of confidentiality. Inform the principal and consult with the appropriate line-manager and support staff within your respective school and/or education sector (for example, school psychologist).

What to do next

Always follow school protocols and emergency management procedures, as well as respective education authority policy. However, recognise that even with the best policy and staff training practices in place, factors such as personal experience, the type of disclosure, time and location of disclosure, mean that sometimes staff may not always follow these exactly. Likewise, the capacity to talk about mental health issues and reflect on actions, behaviours or feelings can be difficult for some staff. Be accepting of other ways that staff may respond or make sense of a student's mental health and where appropriate work alongside them in an educative and non-judgemental manner. That said, all school-based decisions should foremost prioritise the safety and support needs of a student at risk, and consider any possible impacts on others such as family, friends, bystanders, and witnesses.

Working with families

While it is no doubt challenging to initially broach a mental health concern with primary caregivers, their involvement is essential to the effective mobilisation of support across the individual, family and school levels. Research shows that parents/guardians often struggle to identify and access child and adolescent mental health services without support. Similarly, it may take time for some parents/guardians to accept and fully understand the implications of the mental health concerns raised, or associated behaviours (for example, self-injuring may give relief from unwanted emotional distress). Nevertheless, early, open, honest and direct communication is paramount with parents/guardians. Two key reasons underpin this suggestion. First, it is worth being mindful that some parents/guardians in regional and remote communities can feel highly guilty, marginalised and disempowered by the necessity to school a child away from home and the family unit. Second, when it becomes apparent to a parent/guardian that their child is experiencing a mental health problem, the overriding sense they will want to both hear and feel, is that their child is safe and the staff prioritises the health and well-being of their child.

The relationship between school and parents/

guardians should never be put at risk through poor communication practices, or by diminishing the seriousness or severity of the mental health concern. That said, it is not uncommon for adolescents to want their mental health matters kept private from parents/guardians. In some cases, involving significant adult caregivers may make the situation worse (for example, in cases of abuse). As a general rule, and where appropriate (for example, no family court orders in place), significant adult caregivers should be informed and involved in any decision concerning the mental health of a student. Proactive communication with significant adult caregivers in the lives of young people increases the likelihood of early engagement with the appropriate support service. Perhaps more importantly with respect to adolescence as a developmental phase, the student of concern should be involved in any decision-making processes and conversations with the caregivers. This actively facilitates trust and crucially extends to young people a genuine sense of voice and empowerment in sourcing the type of support they desire and want.

When talking with parents/guardians it is important that both immediate and longer-term support options are discussed. If the mental health concerns are associated with any medical (for example, trip to the emergency department) or disciplinary (for example, bullying) action that requires the principal to call the caregivers, it is advisable that the school psychologist (or equivalent) call the caregivers first. This provides space for the psychologist to discuss their concerns for the student and prepare the caregivers for any call from the principal. Bear in mind that when a child has mental health concerns, this will also impact the parent/guardian. Recent research has noted 'parental secondary stress' among parents/guardians of young people who self-injure, with parents/guardians reporting disrupted family routines, feeling resentful, and a sense of guilt and worry. As such, be mindful that some parents/guardians may also need support for their own well-being.

Communication with external professional support services and ongoing support at school are equally important. A collaborative, case-management approach that holds a young person at the centre and seeks to generate an individualised support plan with input from key stakeholders is generally accepted as good practice. Young people are often the experts of their lived experiences, and meaningful engagement and participation in processes about their own mental health and support needs, optimises the extent to which any agreed-on intervention is likely to be taken-up and adhered to. If a student has had an extended period away from boarding school in response to a significant mental health concern, make time to meet with them prior to arriving back and discuss what the reentry process might involve. Use this time to plan, explore and develop support options, and perhaps discuss some of the benefits of formalising this information into a return to school support plan. Frequently monitor and review the reentry experience, check-in with the student and feedback information periodically to parents/guardians.

Summary

In sum, if concerned about a student, choose a quiet time and place to approach them. Adopt a respectful curiosity, and express a genuine desire to understand their situation, from their point of view. Avoid trying to 'fix' things for the student, or promising 'things will get better'. As mentioned, often just knowing someone is there to listen is all a student initially needs to feel supported. ▲

RECOMMENDED FURTHER READING

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The Alliance of Girls' Schools Australasia is a not for profit organisation which advocates for and supports the distinctive work of girls' schools in their provision of unparalleled opportunities for girls.

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