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Embracing Change

Jennie Quinn & Penina Kiss

A very warm welcome to our final edition of the WTW newsletter for 2023. We hope that it's been a wonderful year and that you are looking forward to 2024 with a sense of curiosity and excitement. What big change events will 2024 hold for us? Will we be ready to pivot and adapt or has change-fatigue set in rendering us ill-equipped to deal with what will inevitably head our way?

As we look back to the beginning of 2023, it's fair to say that Education was faced with one of its biggest changes and indeed challenges for some time. The explosion of Generative AI onto the educational landscape certainly caused alarm amongst educators and academics who found themselves surrounded by headlines claiming *the death of education* as we know it thanks to a Large Language Model known as ChatGPT.

Slowly the fear was replaced with curiosity and a desire to learn everything we could about this new player in the educational sphere and how it would impact teaching and learning. Education Systems and Administrators have been slow to release policies and guidelines and here in Australia, we are still awaiting the imminent release of the *National Framework on using AI in Education* but that hasn't stopped creative teachers across the country from pivoting, adapting and embracing this newest technology. They understand the urgency to support a learner cohort who are way ahead of the game, skilled at using this technology and in desperate need of guidance on its ethical use.

At a recent conference on AI in Education this critical issue of ethics in AI was explored. The notion that AI is challenging what has been a lack of ethics in society and that we have lost the ability to have nuance resonated strongly. As a collective, we have allowed society to take a particular ethical path and AI has brought that into stark relief. What we see in social media are increasingly black and white responses. We have a responsibility to teach our students the real value of ethics and critical thinking and to ensure that the use of AI in education is fair, valid and balanced. That is our challenge, to teach our students to be people of character and discernment.

For our gifted students, the benefits of AI in education are many. In a recent article, *A Role for ChatGPT and AI in Gifted Education*, Siegle et.al, (2023) outlines how gifted students with unique learner characteristics requiring specialized programs can benefit from the use of AI to support advanced content, personalized learning, collaboration, research skills, image manipulation, critical thinking, problem-solving and advanced technology. The ability for teachers to use Generative AI to create highly personalised and differentiated learning tasks is an exciting aspect of LLMs.

And so we find ourselves at the close of 2023 safe in the knowledge that we did not encounter the death of education as we know it. On the contrary, we have embraced a new tool capable of adapting to individual student needs and providing personalized learning experiences. Educators everywhere have proven that once again they are the masters of pivoting, adapting and innovating to embrace change.

In this month's edition of the WTW newsletter, we are delighted to bring you three unique perspectives on gifted education. Pamela Clinkenbeard delves into neuroscience research and more specifically the idea of neuroplasticity with respect to maximizing the potential of gifted students in three areas; talent development models, training of executive functions, and the critical importance of appropriate challenge. Sandeep Dhillon tells the mesmerising story of her young life, exploring the paradox of her giftedness, and sharing with us her passion for teaching and ferocious writing talent. And finally, Jo Quinlan shares her insights on the benefits of implementing a mentor program that supports gifted mathematicians. The success of the program has left the school keen to apply their learning to an even more rigorous implementation in the future.

We hope you enjoy the December edition of the WTW newsletter.

Jennie and Penina

References

Siegle, D. (2023). A Role for ChatGPT and AI in Gifted Education. *Gifted Child Today, 46*(3), 211-219. https://doi.org/10.1177/10762175231168443

Does it matter if their brains are different? Practical implications of neuroscience research for gifted education

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The field of educational neuroscience (aka mind, brain, and education, or MBE) has boomed in recent years. Neuropsychologists have come out of their laboratories and entered the world of schools and children's thinking (see Rogers & Thomas, 2023). Research in the field, broadly defined, ranges from brain imaging studies that investigate associations between types of tasks and activity in various brain regions, to classroom studies that investigate the effectiveness of interventions that are based in cognitive science. Research on neuroscience and giftedness may look at brain differences in students who have been identified as gifted (usually via an IQ measure) or may investigate patterns of brain structure and function in students with great talent in a particular domain or those who are twice-exceptional. Math ability is probably the most-researched talent domain (Myers, Carey, & Szücs, 2017). Miller and Clinkenbeard (2020) provide an overview of some of this research and discuss its potential and pitfalls.

A special issue of the Roeper Review journal in 2008 focused on cognitive neuroscience and the gifted (Kalbfleisch, 2008). Many of the major issues addressed then are still being considered today. One is the problem of over-application: we know a lot about the brain from various laboratory studies, but that doesn't necessarily translate to evidence-based practice on how to teach or how to parent. Regarding special populations, there are many studies looking at twice-exceptional students, particularly gifted children who are neurodiverse. And of course the technology of examining the brain continues to develop at a rapid pace. One of the most frequent technologies currently used is fMRI, functional magnetic resonance imaging, which scans both structure and function - essentially what's going on in the brain, and where, during a particular task.

While the brain is inherently fascinating to most of us, does it really matter for teaching or parenting gifted children that they may have different proportions of gray matter and white matter, or more efficient neural processing (Basten, Hilger, & Fiebach, 2015)? Sample sizes are small and many investigations are preliminary in research on neuroscience and giftedness. (Perhaps it goes without saying that such research should never be used for program identification purposes: there is no valid reason to use brain scan results as a way of determining who should receive, or not receive, advanced educational programming.) Some study of educational neuroscience is making its way into general teacher education programs; "neuromyths" (defined as beliefs about the brain that are not true, such as "We only use 10% of our brain") are rampant, even among educators. There is a broad literature called "science of learning" that sometimes documents the neuroscience evidence for various teaching practices; not everything that is marketed as "brain-based" is supported by solid evidence.

Following are three areas in which neuroscience research may actually guide our practical actions with respect to maximizing the potential of gifted students, and they are all related to the concept of neuroplasticity: the idea that the brain changes over time, not just as a result of growth and maturity, but also as a result of environmental inputs. The brain affects learning, but learning affects the brain. The three areas are support for talent development models, training of executive functions, and the critical importance of appropriate challenge.

Neuroscience Research Supports Talent Development Models

One of our biggest challenges in gifted education is to find and nurture giftedness among students who are traditionally underrepresented in advanced programming, and to do so meaningfully and early, partly as a way of preventing later achievement gaps. Even so, we know that children from impoverished backgrounds often enter school on day one already substantially behind their more advantaged peers in a variety of skills. Recent research on neuroplasticity can help us expand the size and diversity of the pool of young children who might be considered for advanced programming and services. The worldwide move toward talent development models (and away from a "you're gifted or you're not" approach) is supported by this research (Clinkenbeard, 2012), which shows clear evidence of the malleability of young children's thinking skills: malleability, or plasticity, refers to the ability of the brain to adapt and improve. We all have malleable brains and we can all get "smarter," but young children's brains are particularly malleable. Instead of just looking for children who are already performing far ahead of their age peers, could we not also teach and nurture young students in ways that might raise the skills and performance of many more of them to "gifted" levels?

Executive Functions Can Improve with Training

Some neuroscientists investigate how to improve thinking skills in young children, but which specific skills are they addressing and measuring, and why those skills? Most of the research in this area has been conducted on "executive functions." These include such skills as selective attention (focusing on appropriate input), cognitive flexibility (adapting to change), inhibitory control (resisting habits as needed), and working memory (remembering the current rule or task). These skills are important for school success in both cognitive and social-emotional domains: completing complex tasks and getting along with others both require executive functions. From laboratory and school-based research (Diamond & Link, 2016), we know in general that young children's executive functions (EFs) can be improved with training. We

also have evidence that such training, when appropriately challenging for the individual students, can transfer to a variety of other academic and social-emotional outcomes that are important for school success, including fluid intelligence, nonverbal IQ, receptive language, and social skills and behavior. They are also somewhat predictive of better math and reading scores later in the elementary school years.

Optimal Brain Development Requires Appropriate Challenge

The baseline conditions for optimal brain development in children are not a big secret. An Aspen Institute report (Immordino-Yang, Darling-Hammond, & Krone, 2018) lists quality sleep, adequate nutrition and low exposure to toxins, physical activity, emotional and social well-being, and cultural well-being and a sense of belonging. Any college student who studied psychology would probably be reminded of Maslow's theory. Although millions of children around the world are denied these basic conditions, parents who can provide them may breathe a sigh of relief (Miller & Clinkenbeard, 2021). However, the importance of appropriate challenge for optimal brain development in gifted students can be overlooked. First, the research on neurogenesis (the development of new neurons and new connections) shows us that tasks need to be novel or challenging in order for new neural connections to be made. Wasting time on tasks that are too easy is not supportive of brain development. Second, the neuroscience of motivation makes clear that appropriate challenge underlies states of "flow," and the concept of neuroplasticity is completely consistent with a growth mindset. Finally, neuroscience (or "brain research") could be a very compelling argument for advanced programming when we advocate with policy-makers and legislators. The allure of neuroscience could be employed in a persuasive way to support helpful policy action.

Research on neuroscience and giftedness can be interesting in itself; understanding better how our brains work is a worthwhile pursuit on its own. But it also lays a foundation for practical action in gifted education. It provides a strong scientific rationale for talent development approaches; it documents the ability to train and improve executive functions, especially with underrepresented children; and it magnifies the arguments for providing appropriate challenge to all children, including those with gifts and talents.

References

Basten, U., Hilger, K., & Fiebach, C. J. (2015). Where smart brains are different: A quantitative
meta-analysis of functional and structural brain imaging studies on intelligence.
Intelligence, 51, 10 – 27. https://doi.org/10.1016/j.intell.2015.04.009

Clinkenbeard, P. R. (2012). Neuroscience and young children: Implications for the diversity of
gifted programming. In R. F. Subotnik, A. Robinson, C. M. Callahan, & E. J. Gubbins
(Eds.), *Malleable minds: Translating insights from psychology and neurosciences to gifted education* (pp. 197-207). Storrs, CT: National Research Center on the Gifted and
Talented.

Diamond, A. & Ling, D. S. (2016). Conclusions about interventions, programs, and approaches for improving executive functions that appear justified and those that, despite much hype, do not. *Developmental Cognitive Neuroscience, 18, 34-48.* http://dx.doi.org/10.1016/j.dcn.2015.11.005

Kalbfleisch, M. L. (2008). The cognitive neuroscience of giftedness [Special issue]. *Roeper Review, 30*(3). https://www.tandfonline.com/toc/uror20/30/3

Immordino-Yang, M. H., Darling-Hammond, L., & Krone, C. (2018). *The brain basis for integrated social, emotional, and academic development.* Retrieved from https://www. aspeninstitute.org/publications/the-brain-basis-for-integrated-social-emotional-and- academic-development/

Miller, E. M. & Clinkenbeard, P. R. (2020). Mind, brain, and the education of gifted children. In J.A. Plucker and C. M. Callahan (Eds.), *Critical issues and practices in gifted education: A survey of current research on giftedness and talent development* (3rd ed.). Washington: National Association for Gifted Children and Waco, TX: Prufrock Academic Press. DOI: 10.4324/9781003233961

Miller, E. M. & Clinkenbeard, P. R. (2021). Using neuroscience research to guide your parenting: Finding the signal and ignoring the noise. *Parenting for High Potential, 10*(2), 19-23, 27. https://nagc.org/page/Parenting-High-Potential

Myers, T., Carey, E., & Szücs, D. (2017). Cognitive and neural correlates of mathematical giftedness in adults and children: A review. *Frontiers in Psychology, 8*(1646). https://doi.org/10.3389/fpsyg.2017.01646

Rogers, C. & Thomas, M. S. C. (2023) *Educational neuroscience: The basics*. London: Routledge. DOI: 10.4324/9781003185642

Prologue - My Life's Journey Through Literature

Sandeep Dhillon
Literary enthusiast

As an adult, I realise that everything I know about the human condition is encapsulated within hundreds of pages of books, delicately transported through the written word, carried by intriguing characters, and laid out before me on crisp pages, where penciled thoughts decorate the margins.

When I was six, I read my first novel, *Charlie and the Great Glass Elevator* by Roald Dahl. Yes, I started with the sequel. This was the first and last time I was incredibly creative with my reading style. When I was this young, I didn't know just how much I was going to learn from reading. Now that I am much older than six, every time I stare at the intimidating copy of Marcel Proust's *Swann's Way*, gifted to me by my teacher when I was eleven, I am both confronted and inspired by how much I still have to learn.

My love for literature has been a journey imbued with purpose, leading me to unforeseeable, and seemingly paradoxical discoveries of the self. Books weren't merely an impetus for strong communication and analytical skills. They were amongst the greatest teachers of mine, seeing me through a tumultuous upbringing, to under-stimulation for most of secondary schooling.

The story (so far) goes like this:

The short version: Following the advice of her secondary school English teachers, a high achiever pursues a law degree only to realise she actually wants to be… an English teacher.

If the short version piqued your interest, here's the long one:

The fondest memories I have of school are the friends I made along the way. By 'friends', I mean a handful of teachers who left an impermeable mark on my mind, and the characters I met in the many, many books I read, who were my lens for viewing the world. As an adult, it is no surprise that I have more books than (human) friends, and I don't have a TV. This is by choice.

Part 1 - Lessons from literature

At 12, Harper Lee introduced me to the interplay between mortality and law, and the wisdom of children. Shortly after, Orwell plucked me out of segregated America, plunging me into the depths of dystopia, where I witnessed power and control from a political lens.

At 16, Cormac McCarthy beckoned me to examine matters of the soul, helping me simplify God's incomprehensible love through the eyes of a child. Similarly, T.S. Eliot grounded me spiritually, teaching me the redemptive force of music, art and nature, in a world that could desecrate my body and destroy my spirit.

While grappling with matters of the soul, W.B. Yeats wiped my tears amidst a teenage heartbreak at 17, where the colour of my skin was a barrier to love and companionship, W.B. Yeats taught me to embrace impermanence. This lesson resurfaced a decade later, reminding me that some loves are beautiful, *because* they are permanent, and some loves - though fragmented - are beautiful, because even space and time cannot understand them.

For half a decade after school, I was seduced into an intoxicating affair with law textbooks, selfishly driven by a pragmatic career, though I never forgot my first literary loves. I understood the legal world of rigor and detail, but it didn't understand *me*. After several personal trials and extreme burnout, the world of fiction welcomed me home, with open arms. Like the high school sweetheart in a cheesy rom-com, *the one* was in front of me all along.

Though I was estranged from the world of fiction for the longest time, at 26, Camus taught me that one can't heal and know at the same time, which, coupled with Yeats, proved that suffering catalyses insight, imbuing it with purpose. At 27, John Steinbeck taught me that we have the ability to overcome evil, because we are intrinsically good. As I write this piece at 28, I know Tolstoy is teaching me something - I'm just not sure what because I'm only 30 pages through!

Part 2 - A meeting with mentors

Despite literature cultivating my empathy and curiosity, my senior English teachers defined my giftedness by my high academic performance. I recently discovered that this limited my identity as a gifted learner, realising that 'high achiever' was synonymous with 'burn-out' and 'perfectionism'. Years later I discovered that giftedness was more multidimensional. Being a gifted learner in an environment where the concept was reduced to intellect left me feeling misunderstood.

On this narrow view of giftedness, my teachers encouraged me to pursue a traditionally academic career. The conversation went like this:

Female English Teacher: Sandeep, what are you thinking of studying at university?

Me: Philosophy or English teaching.

Female English Teacher: Oh, you're too smart to be an English teacher. Go and study something like law or journalism.

Male English Teacher: If you really want to teach though, be a university lecturer. Those students actually want to be there.

I can assure you that as a university student, I absolutely did not want to be in those dry, under-stimulating law classes. Despite my verbose and analytical nature, I didn't care for a carefully constructed contract nearly as much as I cared for an evocative metaphor.

I have nothing but gratitude for the sincere guidance of my English teachers. With the expanding literature on giftedness, I trust that a decade later, their advice would've been different. For them, my intellectual ability was the pinnacle of giftedness. They knew I was moved by literature, committed to social justice, and was an excellent writer and orator. To them, a legal career made sense. It encapsulated justice, a strong command of language, and never-ending reading.

Part 3 - The paradox of giftedness

Though I deeply contemplated, and was moved by the lessons of literature, I was not a high performing student in junior English. Despite knowing that I had read Lee and Orwell at age 12, the teachers didn't bat an eyelid when I achieved mid Bs in English. When considering subject selection for my senior years, the English Coordinator advised I would struggle in the highest level of English. Two years later, I was one of 5 students who undertook it. For five years, I tutored several students from Years 8 to 12 in English. Nine years later, I started to write my first book. Eleven years later, I discovered that the most authentic way I can contribute to the fundamental rights and potential of young people is through teaching literature.

During our first week of senior English, we were assigned an analytical task on poetry. Disheartened by my experience at the junior campus, I left the classroom without checking my mark. I didn't check my mark. The teacher caught my attention, asking if I was dux at the junior campus. She was surprised to learn that I barely scraped Bs in English, as I was the only student in the task to achieve an A grade on the homework, followed by a low C. I stood next to my best friend (who received a D, but was one of the highest performing on the junior campus), and awkwardly listened to my teacher explain my real gift for expression and analysis. *A real gift* I thought. For the next two years, this teacher encouraged me to engage with complex texts, supported the diversification of my knowledge across my subjects, and adapted to my needs, marking my papers in green, not red. Before I knew it, I held top ranks across 5 out of 6 of my subjects at the end of Year 11, and more often than not, achieved full marks on my English essays.

My peers were envious when they learnt of my marks, and annoyed when they realised that most of my assessments were written the night before, after making sandwiches for 6 hours. They hypothesised that my intelligence came down to sheer luck and a supportive family. However, no one was curious enough to understand how I could possibly achieve high marks. In hindsight, I realise that strong academic performance doesn't necessarily translate to giftedness. Perhaps it's the inclination to stretch both the mind and heart that is the real clincher.

To prove I wasn't real competition, or even wanting to achieve a final school mark higher than 70 (at this point, I wanted to pursue Philosophy, a goal borne out of my Year 12 project on whether Ancient Western Philosophy had an impact on the attitudes towards morality in the 21st century - a tall ask for a 16 year old), I assisted my peers with their essays, including the Dux of the senior college.

When my peers asked me how I *just got* the texts and *just wrote* the essay, they never *just got* the truth. My ability was anchored in my personal context. Studying the likes of W.B. Yeats and T.S. Eliot empowered me to do one of two things with suffering: fixate on the pain or become curious about the chaos, transforming my suffering into resilience and compassion. The latter became a blueprint for my life, as I searched for the meaning in being a carer for 3 younger siblings, witnessing domestic violence, working 25 hours a week to pay for school fees, and deteriorating health, which at 26, finally received the label of 'Inflammatory Bowel Disease'.

What I wish I could've told my peers is that I would've given anything to receive a C grade in English, if it meant that my A grades weren't achieved through a nuanced understanding of pain in my young life. I didn't need to ask my teachers, "What's the point of learning this if I won't use it in real life?", because I was already using it in real life. When pain drowned me into extreme depression and dis-association, I turned to literature - my ultimate solace.

Part 4 - Learning by teaching

Throughout my 5 year degree, I worked in a small law firm, volunteered at a Community Legal Centre, and undertook several research internships. I simultaneously had part-time jobs, including secondary English tutoring. Despite the fatigue, I was always energised to support young people. In my incredibly limited teaching experience, some stand-out moments included:

- When the entrepreneurial minded Carly, (15) entered our lesson exclaiming "Sandy! I finally found a book I want to read just for fun!! It was by Jodi Picoult, whose stories typically involved average families experiencing ethical and medical dilemmas. Indeed, there is a book for everyone.
- When Timothy, (16) who struggled with dyslexia, and the weight of his family's business, tossed a crumpled piece of paper onto the table (his homework). "Timothy! You only had to write a paragraph!". He had attempted the whole essay alone. Three years prior, Timothy seldom read aloud, and struggled writing three letter words. He glared at it, disgruntled, as tears welled up in my eyes and I had what I consider a 'proud mum' moment.
- When Anthony, (17), a strong STEM performer, received his final subject marks and was awarded his highest mark in English. He now runs a tutoring business, in Math and English.
- When Shantelle, (16) ranked 30/42, climbed up to rank 3 in her final year. Although initially exhausted during our lessons, she eventually entered them with enthusiasm, feeling encouraged in her ideas and interpretations of the text. She had even started to analyse her favourite shows from a literary perspective.

Over the five years I spent tutoring, these students, along with encouraging employers, younger siblings, friends, strangers, and my godmother (a brilliant teacher, who probably saw this coming) delivered hopeful and encouraging messages towards reconsidering a career in teaching. When I was preoccupied with the stigma of the profession, namely comments such as "but you studied law, why would you be a teacher?", I was reminded that my motivation for this was to impact the fundamental human rights of young people. Every moment I spent remembering this gently nudged me closer to making the decision.

Part 5 - A return to roots

A few years after university and into the workforce, I had an increasingly sunken feeling that I was not misguided, but misunderstood. I wasn't intelligent because I cultivated my knowledge in a quantifiable way. I was just inherently curious about joy, suffering, and everything in between. I always sought to be empathetic, which incidentally strengthened my ability to analyse, communicate and problem solve, all of which was bundled into a nice package labeled as 'intelligent'.

By the time I was twelve, I felt the impact of a story - which I recently learnt is known as bibliotherapy. I was saddened to have been pigeonholed into a field that called for my intellect, but not for my spirit. I didn't want to be in the foreground, meeting adults and talking business. I wanted to be most like my humble, but highly influential teachers; the teachers who encouraged me to grapple with some of the most challenging pieces of English literature, and to stretch my mind in ways that preparing a legal case might not have; the teachers who would spend hours with me every week helping me leave a written mark on the world, through the use of language.

To this day, I view the world through literary eyes. Poignant metaphors emerge from difficult experiences. Deep, resounding joy is captured, but not reduced by, carefully curated sentences.

Though my English teachers encouraged me to pursue a career oriented towards my intellect, they unintentionally catalysed a meaningful journey, where the deepest recesses of my mind called me back to my roots - a lover of learning, and sharing of knowledge. Sometimes I feel like I neglected these roots for too long, leaving me with a bittersweet blend of regret and gratitude. Perhaps my teachers trusted I'd revisit English teaching, and that as a lover of learning, saw the value in self-realisation, where I relied on my own giftedness to see me through a process of re-learning, bringing me to this very moment, where I realise that just like every great story, the unexpected plot twists always end up making complete sense.

Modifying the Maths curriculum for gifted students in the Junior School: What effect does mentoring have on learning in Maths?

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MacLeod (2004) suggests that curriculum designed to challenge and meet the needs of gifted learners must address their need for increased pace and complexity, and allow for instruction and scaffolding for learning that may not require the level of repetition and support needed in a regular classroom.

At the start of 2020, the Gifted Education support teacher in the Junior School worked collaboratively with Year 6 teachers to analyse a range of qualitative and quantitative data collected on student achievement in Maths - anecdotal observations from 2019 Year 5 teachers and early observations from 2020 Year 6 teachers, 2019 APSMO Maths Olympiad scores, off-level PAT Maths results and Numeracy results from the Year 5 NAPLAN test – to identify a group of students who could benefit from involvement in a challenging Maths curriculum.

The Maths curriculum was differentiated using the following ***teaching approaches*** that are well suited to gifted learners (Munro, 2012):

- ***Clustering*** students achieving highly in Maths,
- Completing an end of Year 6 maths test at the beginning of the year to determine students' existing knowledge and skills. This has allowed
- ***Compacting of the Maths curriculum***, reducing time spent on reviewing Year 6 syllabus content that students have already mastered and focusing on addressing a few gaps.
- ***Telescoping the Maths curriculum*** by teaching content at a faster rate and accessing content and skills from resources typically developed for older students
- ***Participating in extracurricular programs*** such as the Senior Division of the Maths Olympiad competition (developed for high achieving maths students in Yrs 7 & 8), the BEBRAS Challenge, and the Australian Maths Trust.
- Australian Mathematics Competition.

Recognising that there is still a range of abilities within this cluster of students, many of the mathematical tasks designed for this modified Maths curriculum make use of the low-floor high-ceiling (LFHC) framework advocated by Jo Boaler (Professor of Mathematics Education at Stanford University and founder of Youcubed). LFHC tasks are sometimes inspired by real-world problems, usually open-ended and often visual, with a layer of abstraction and/or complexity that allows everyone to get started at the "floor" that best suits them, and continuing to work mathematically until they get stuck at their own "ceiling" (NRICH Maths, 2013). LFHC tasks encourage students to ***manage the pace and depth of their own learning***. When students are exploring LFHC tasks, the teaching role shifts to that of facilitator, checking in to guide or ask the right questions at the right time, helping students stretch themselves wider and/or deeper as they explore further. Well-designed LFHC tasks aim to put students into places of struggle:

"Neuroscientists have found that mistakes are helpful for brain growth and connectivity and if we are not struggling, we are not learning. Not only is struggle good for our brains but people who know about the value of struggle improve their learning potential." (Boaler, 2019).

Working in a Pre-K to Year 12 school where there is access to human resources and expertise on site, provided an ideal opportunity to explore another strategy that is of particular benefit to gifted students – mentoring. Berger (1990) maintains that exposure to a mentor who is willing to share values, interest, time and talents is one of the most valuable experiences a gifted student can have.

Two teachers – a Senior School Maths teacher and a Junior School Gifted Education support teacher - met late in 2019 to consider the possibility of establishing a mentoring relationship between high achieving Year 6 Maths students and high achieving students in the top Year 9 Maths class. The teachers agreed to run a trial program in 2020, to see if and what value could be added to learning in Maths for both mentee and mentor students. The teachers had an open-minded and flexible approach to the program, and did not go into it with pre-conceived expectations or goals, or a fixed plan in mind. Both teachers committed to supporting the mentoring program for the year, sharing responsibility for the design and development of mentoring sessions. Teachers made use of resources they were already familiar with, and adapted activities to a LFHC design to facilitate learning for both Year 6 and Year 9 students. Technology can be a useful aid to mentoring programs, so a shared Class Notebook was created, so students could continue working together asynchronously in the Collaboration Space if desired.

The success of mentorships usually depends on the compatibility of the partners (Schatz, in Bisland, 2001), and the mentor and mentee feeling they have not had a mentoring relationship forced on them (Clark, 1999). This mentoring program could have been doomed from the start given that it was initiated by teachers, and students were randomly paired by the teachers. However, the opposite outcome has eventuated, where students have been keen to meet with their partner, eagerly anticipating each of the mentoring sessions.

Student commitment to the mentoring relationship is more likely to result in a successful partnership. Teachers have observed varying

levels of commitment from both mentors and mentees. Some of the Year 9 mentors have demonstrated high levels of commitment to the partnership as evidenced through kind and helpful asynchronous feedback they wrote on work that Year 6 students submitted to their shared Class Notebook, while others left no feedback at all. Some Year 6 students have responded to feedback from their mentors, while others have not.

Clasen & Clasen (1997, in Clark, 2001) suggest that mentors can be motivated, stimulated, and challenged through mentoring, while Berger (1990) found that mentees reported benefiting from having a role model from whom they receive support and encouragement. Teacher observation of partners interacting together on mathematical tasks, and listening to learning conversations between mentor and mentee suggests that these benefits occurred. Feedback from students supports this:

"I like seeing how the Year 6 students see and think about problems differently to how we might do them"

"I like having the opportunity to explain my understanding and play the role of the teacher"

"I like seeing what is ahead of us in Maths and working with older students" "I like working with a Year 9 student who thinks and works differently to most of my Year 6 peers"

The mentoring program has faced challenges too. The Year 6 and Year 9 Maths timetables align for one period once each fortnight. Disruptions to the timetable resulting from online learning and a re-imagined school year meant that face-to-face mentoring sessions have occurred infrequently. Use of the Class Notebook to support collaboration on tasks asynchronously has not eventuated.

However, both teachers feel that the mentoring program has had very positive outcomes. It would be worthwhile applying learning from this year's open-ended, relaxed project to a more rigorous mentoring program in the future, such as:

- Developing and administering a survey to 2020 mentors and mentees to gather data about their evaluation of and reflection on mentoring in Maths.
- Analysing student survey submissions, and teacher evaluations to determine if/how the program has affected learning in Maths for either or both Year 6 and Year 9 high-achieving Maths students.
- Clasen & Clasen (1997 in Clark, 2001) maintain that mentoring needs to be a flexible arrangement, so that emerging needs, interests, and issues can be explored, which suggests that students need choice regarding participation in a mentorship, and more input into the design of the mentoring program. Consideration also needs to be given to how mentoring relationships can be personalised and facilitated to better meet the needs, interests and issues of the partners involved.
- Making use of Clark's three phases of the mentoring relationship (1995) to pre-plan mentoring programs:

1. Establishing the mentoring relationship where mentors and mentees are identified, goals and expectations are discussed and a development plan is created, so that mentors and mentees understand the purpose of the relationship, their responsibilities and the benefits they hope to achieve
2. Implementation of the development plan. Students could be encouraged to keep a journal documenting the experience, which would provide a powerful means of self-evaluation.
3. Evaluation of and reflection on the mentorship by mentor and mentee.

References

Berger, S. (1990). *Mentor relationships and gifted learners*. Hoagies Gifted Education Page. Retrieved on September 8 from https://www.hoagiesgifted.org/eric/archived/e486.html

Bisland, A. (2001). Mentoring: An educational alternative for gifted students. Gifted Child Today; Fall 2001: 24.4. ProQuest.

Boaler, J. (2019, Oct 28). *Why Struggle Is Essential for the Brain — and Our Lives.* Retrieved on September 8 from https://www.edsurge.com/news/2019-10-28-why-struggle-is essential-for-the-brain-and-our-lives

Clark, E. (1995). Mentoring: a case example and guidelines for its effective use [online]. Youth Studies Australia, Vol. 14, No. 2, Winter 1995: 37-42.
Availability: <https://search-informit-com au.ezproxy2.library.usyd.edu.au/documentSummary;dn=951009496;res =IELAPA> ISS N: 1038-2569. [cited 08 Sep 20].

MacLeod, B. (2004). *Gifted and Talented Education Professional Development Package for Teachers. Module Five: Curriculum Differentiation for Gifted* Students [PDF file]. Gifted Education Research, Resource and Information Centre (GERRIC), The University of New South Wales (UNSW). Retrieved on September 5, 2020 from https://docs.education.gov.au/system/files/doc/pdf/gifted_talented_education_mod ule5_primary.pdf

Munro, J. (2012). *Effective strategies for implementing differentiated instruction* [PDF file]. Australian Council of Educational Research. Retrieved on September 5, 2020 from https://research.acer.edu.au/cgi/viewcontent.cgi? article=1144&context=research_co inference

NRICH Maths. (2013). *Low Threshold High Ceiling – an Introduction*. Retrieved on September 5, 2020 from https://nrich.maths.org/10345

Call for Articles

We would like to invite you to write an article for the WorldTalentWeb newsletter. The theme and writing style are open for the author to determine. Articles could take the shape of an interview with a specialist in the field, a report on research or a recent event, a book or resource review etc. The guidelines for the article are listed below.

Please submit your article to the following email: WorldTalentWeb@ha.ae

Guidelines for submitting an article for the WorldTalentWeb newsletter

1. A submitted article should be between 800 to 2000 words, not including references.
2. WorldTalentWeb newsletter caters to the international community and thus, all articles should be written in English.
3. American or British spelling is accepted.
4. All non-native English speakers should make sure to check their articles for language accuracy before submitting them.
5. The article should be in Times New Roman font, size 12 pt.
6. Authors should avoid using footnotes.
7. Authors should adhere to the APA style and/or formatting guidelines provided in the APA Manual, 7th Edition.
8. The article should be submitted with embedded photos, and tables, and figures if relevant.
9. The article should be submitted as an email attachment as a Microsoft Word document.
10. Articles should be word-processed and single-spaced with 1 inch (2.54 cm) at the top, bottom, left, and right of every page as per the APA 7th edition requirements.
11. Authors should strictly observe the copyrights-requirements and cite the work of others correctly.
12. Relevant permission should be obtained if photos of people are used. An email giving permission to use photos publicly is sufficient.·
13. Authors should include their full name, title, institutional affiliation, and a high-resolution color photo.
14. If an article was published before elsewhere, then only submit a summary of the original document with acknowledgment.
15. Authors are encouraged to use supportive pictures.
16. The editorial team reserves the right to edit articles accepted for publication.

The current and previous issues of the newsletter can be accessed on the WGC website:
https://wgc.ae/newsletter

Call for Advertising Conferences

Looking to share your conference with the world?

Send a brief description of the conference to:

WorldTalentWeb@ha.ae

(not more than 70 words)

“The WorldTalentWeb newsletter’s team is very happy to advertise your conference.”

Editorial Board

The *WorldTalentWeb newsletter* is bimonthly published by the World Giftedness Center (WGC) of Hamdan Bin Rashid Al Maktoum Foundation for Distinguished Academic Performance.
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WORLD GIFTEDNESS CENTER

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