THE WOORANNA WAY

Ray Trotter

ONE SCHOOL'S JOURNEY TO CREATE A NEW EDUCATION PARADIGM

Dear Ray & WPPS staff

Please accept the latest version of The Wooranna Way.

Since 2018, Josey has been trialling *School Story Solutions* at Wooranna Park because she wanted to find an engaging way for school leaders and staff to communicate pedagogical concepts to parents and the wider community.

The final product that was launched on Thursday 22 October was the 'tip of the iceberg' involving many tasks such as
• *content auditing & researching what was already published on WPPS* • *editing* • *interviewing and transcribing,* • *book design* • *graphics and many consultations with the leadership, staff and students.*

At all times, Josey attempted to make clear how pedagogical storytelling, that is, stories focused on teaching and learning showing growth and change, were not marketing but a vital form of communication for educators in a digital age.

As you look through *The Wooranna Way*, please give us feedback on what you see and know about the publication through a **SURVEY** (**click on provided link below**).
We estimate that the answers will take you about 10 mins to complete.

CLICK HERE FOR SURVEY

Josey and I look forward to fine-tuning the project with Ray, Janet and members of staff during Term Four.

Dedicated to Sir Ken Robinson and the contemporary educators who have allowed us to stand on their shoulders, and look beyond what is, to what could be.

Whether they have looked to the future as a teacher, staff member, student or a parent, they are all valued co-creators of our school story.

Progress is impossible without *change*, and those who can't *change* their minds, cannot *change* anything.

George Bernard Shaw

The educational journey outlined in this book started at Wooranna Park Primary School in 1996 and continues to be defined. It is a journey without an ending.

Other schools and educators are welcome to use all or part of the book. Reference to Wooranna Park Primary School is appreciated.

The Wooranna Way

One School's Journey to Create a New Education Paradigm

By Ray Trotter *Principal* Wooranna Park Primary School with the support of Jennie Vine & Janet Whittle *Assistant Principals*

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Introduction
Ray Trotter
—Principal

As Principal of Wooranna Park Primary School (WPPS) since 1987, I have had three of my six grandchildren attend my school. Seeing your school through the eyes of a child that you love can be an interesting experience, full of wonderful and sobering interludes. Being told one Sunday morning that my prep grade grandson was crying because he couldn't go to school is very much a highlight, but this needs to be balanced by my inability to answer many of the *'Why can't we?'* questions asked of me. Looking through my grandchildren's eyes has fuelled my desire to create a school where curiosity and excitement pervade children's learning.

Schools, despite their core purpose, traditionally have been places built to service the needs of teachers, rather than learners. They are places where students are told what they need to learn, rather than places where they are encouraged to have agency over their learning (I will later discuss what I mean by 'agency'). The excitement with which children commence their schooling is all too often replaced with a somewhat subdued acceptance that going to school is just another must-do part of growing up.

In 1993, WPPS was appointed a 'Gifted and Talented Resource Centre' by the Victorian Education Department. To meet this responsibility, we initiated a program of workshops for talented students from schools throughout Victoria. While the workshops were always over-subscribed, we realised that even when our own students attended the workshops, they returned to classrooms where little attention was given to differentiating the curriculum, or to providing opportunities for students to negotiate their learning. We had also come to recognise that all of our students, not only those identified as gifted and talented, had talents that needed to be developed. In response, in 1997 we established the 'Autonomous Learning Unit' for our Year 5 and 6 students. Since that time, WPPS has sought to shift the education paradigm for all of our students.
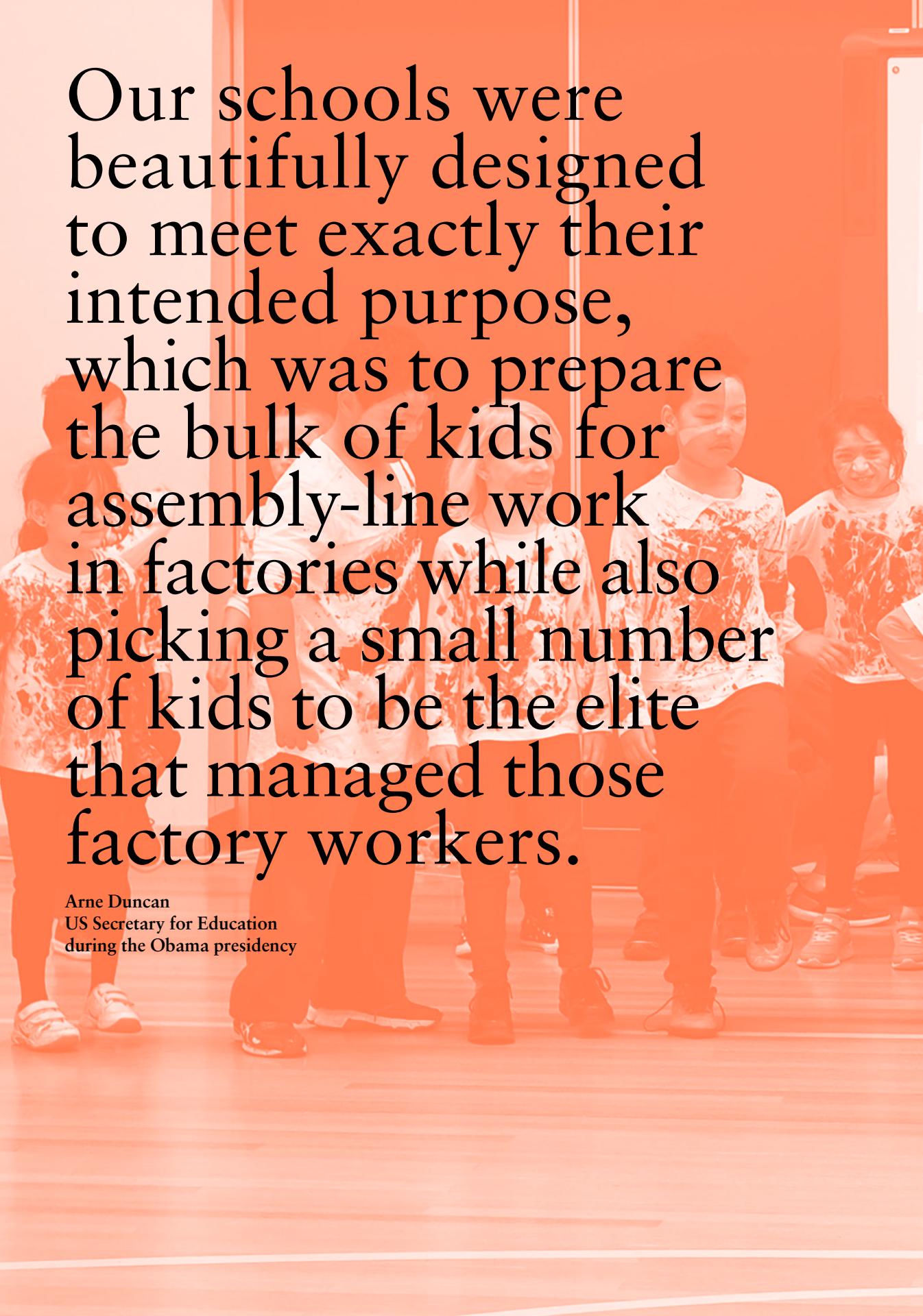
In creating this paradigm shift, the school has had to address the three fundamental questions of why, what and how. Why do we need to change, what are the underpinning principles of such a change, and how will these principles be implemented? In addressing these questions, I will highlight the blend of best and next-practice pedagogy we have developed at the school. The imperative that I hope readers will come to affirm is that primary school students are curious, critical, creative thinkers, capable of astounding their teachers and parents when encouraged to co-design their learning around their passions and interests.

For those readers wishing to transform their teaching and learning practices, the following words written by Buckminster Fuller may open a window to the task ahead:

'You never change things by fighting the existing reality. To change something, build a new model that makes the existing model obsolete.'

▲ Buckminster Fuller

Our schools were beautifully designed to meet exactly their intended purpose, which was to prepare the bulk of kids for assembly-line work in factories while also picking a small number of kids to be the elite that managed those factory workers.

Arne Duncan
US Secretary for Education
during the Obama presidency

Why do we need to change?

The explosion in human knowledge

Today's students are living in a world vastly different from the one in which their parents grew up. The shelf life of education is shorter than it has ever been. **Simon Torok** and **Paul Holper** in their 2016 book *Imagining the Future: Invisibility, Immortality and 40 Other Incredible Ideas* write that at the start of the twentieth century, the amount of human knowledge doubled every 100 years. It now doubles every year and by 2020, according to Torak and Holper, could double every day. Despite this explosion in human knowledge, our school curriculum is still primarily based on the same principles that created compliant workers for factories. **Arne Duncan**, the US Secretary for Education during the Obama presidency, addressed this issue in his 2018 book *How Schools Work*:

Our schools were beautifully designed to meet exactly their intended purpose, which was to prepare the bulk of kids for assembly-line work in factories while also picking a small number of kids to be the elite that managed those factory workers. This is a completely outmoded way of thinking about education. At the highest level we need to change the way we think about what schools prepare kids to do and how they go about doing that. We need to reform education.

▲ Duncan, 2018

Thankfully, the explosion of new knowledge described above is not just shortening the shelf life of education: it is also helping us to identify areas in our approach to schooling that need to be improved. As **Eric Sheninger** and **Thomas Murray** (2017) note, studies in neuroscience indicate that students usually forget most of the fact-based information they are asked to memorise at school. 'Shoving this information into students' brains wastes time and resources,' they observe, 'while engagement plummets'. They also point out that learners crave the opportunity to pursue their passions and interests and to engage in relevant tasks. They highlight the importance of student agency; of developing instructional pedagogical practices that focus on higher-order skills and problem solving; and of 'anytime, anywhere' learning.

An uncertain future

At the same time, our students are facing an uncertain future, with young people around Australia finding it increasingly difficult to obtain full-time work. The Foundation for Young Australians (FYA, 2018) tells us that nearly half of Australia's 25 year-olds face the *new work reality* and are unable to secure full-time employment, despite 60% holding post-school qualifications. The report highlights significant failings in preparing today's students for their working lives, with large numbers of our young people unprepared to enter the workforce.

More than ever before, young people need access to relevant, high-quality education and learning systems that reflect and respond to their changing and diverse needs, and those of the economy. Investment in redesigning learning pathways from education

to work to ensure young Australians are equipped and empowered with the skills, mindset and confidence to navigate The New Work Reality is essential.

▲ FYA 2018, p.3

Research undertaken by Oxford University (Frey & Osborne, 2013) tells us that 47 percent of the world's current jobs are at risk in the future due to global forces. The FYA (2017) identifies these global forces as *automation, globalisation and flexibility*. Their research also highlights the need to better prepare our students for the workforce by prioritising the teaching of STEM subjects and enterprise skills such as problem-solving, creativity and social intelligence, along with digital and financial literacies.

The increase in freelance workers in Australia is also of significance. A study by the freelancer site **Upwork** in 2015 (cited in Chung, 2015) revealed that the Australian freelance economy had grown to 4.1 million—32 percent of the Australian workforce. Yet traditional teaching practices rarely focus on developing entrepreneurial skills in primary school students, or provide students with the opportunity to enhance individual talents that, while they fall outside the traditional subject areas, are valuable in the workforce—humour, film making, public speaking, athleticism, inventiveness and empathy, to mention only a few. Research advocating the development of entrepreneurial skills in primary-age children by the Chinese American educator **Professor Yong Zhao** (2012, 2016a) supports this view.

A recent report prepared by **Kate Torii** (2018) for the Mitchell Institute, 'Connecting the worlds of learning and work', advocates a major shift in our approach to schooling. Central to this shift is the need to strengthen school–industry partnerships across our education system. Torii advances three key policy priorities that she believes will help achieve this:

- school–industry partnerships need to be valued and measured at the system level
- school–industry partnerships need to be a priority in all schools, and
- governments need to make it easier for all parties to engage in school–industry partnerships.

Torii acknowledges the work involved in making these partnerships succeed:

Further work is needed to build greater understanding of the benefits and drivers for industry, as well as the resourcing and supports needed for industry partners to engage effectively with schools.

▲ Torii, 2018, p.20

Underachievement and lack of engagement

Failing to prepare our students to enter the workforce is not the only problem in our schools today. Underachievement and lack of engagement permeate them. **Geoff Masters**, Chief Executive of the Australian Council for Educational Research (ACER), lists the 'long tail' of underachieving students who fall behind year level expectations and fail to meet minimum international standards as a significant problem for Australian schools (2016), while an Australian engagement survey commissioned by the Australian Institute for Teaching and School Leadership (AITSL) shows that a significant number of students fail to feel a sense of belonging at school, or a connection with the learning (AITSL, 2014). Any experienced secondary teacher will tell you that two of the questions students most commonly ask are 'How many words do I have to write?', and 'Will this count towards the end of year exam?' Such questions do not project an excitement for learning!

The Global Education Reform Movement (GERM)

Sir Ken Robinson is one of many educators arguing for sweeping changes to how we educate our students. He shares a belief with **Pasi Sahlberg**, the acclaimed Finnish educator and Professor at the Gonski Institute of Education, UNSW, that the Global Educational Reform Movement (GERM) presently dominating the education systems of most western countries is, in fact, focused on standardising educational outcomes. Hence, Sahlberg's provocative comments in 2012 in his TedTalk address and in *The Washington Post* that educational reforms should be likened to the spreading of a **virus** through the way that

> Curricula are standardised to fit to international student tests; and students around the world study learning materials from global providers. Education reforms in different countries also follow similar patterns. So visible is this common way of improvement that I call it the Global Educational Reform Movement or GERM. It is like an epidemic that spreads and infects education systems through a virus. It travels with pundits, media and politicians. Education systems borrow policies from others and get infected. As a consequence, schools get ill, teachers don't feel well, and kids learn less.

◂ *Washington Post*, 29 June

Arguably, the GERM phenomenon may explain the widespread underachievement reported on in Australian schools. Robinson (2016) recognises, for instance, that our present system of education is based on a particular conception of conformity that prioritises a certain type of intellectual conformity, *inconsistent with the uniqueness and breadth of human intelligence*. 'Some people are good at it; some are not!' By prioritising a narrow concept of intelligence, we might also conclude that our education systems stop looking for other types of intelligence, resulting in a large group of our students being considered low achievers, despite the fact that their talents lie elsewhere.

Standardised testing

Unfortunately, the introduction of the *My School* website and NAPLAN for Australian schools has compounded this problem, by highlighting and praising schools and students good at teaching and learning this narrow range of intellectual intelligence. This often comes at the expense of not focusing on subject areas unfairly judged as less important or not easily tested, as schools feel pressured to streamline their curriculum in search of higher test scores. Of even greater significance is the realisation that building such education structures in western countries has created a generation of students more interested in their grades than their learning (Sheninger & Murray, 2017). For international readers not familiar with the terms, NAPLAN is Australia's 'National Assessment Program' in literacy and numeracy, conducted in Years 3, 5, 7 and 9, and My School is a website that allows parents to assess the NAPLAN results of their child's school against those of other schools.

Regrettably, these are not the only problems associated with NAPLAN. In a recent article, **Jo Boaler**, Professor of Mathematics at Stanford University, points out that traditional teaching practices aimed at the memorisation of number facts for fast recall are hindering children's mathematics learning (2015). In contrast, research shows that students should learn to calculate as they develop their understanding of number, and speed should never be emphasised. She also comments on

the fear and anxiety caused by over-testing which, when combined with a focus on speed, results in many students—particularly those who are more deliberate in their thinking—believing they are not good at mathematics.

The same factors that Boaler sees as hindering children's ability to increase their mathematics skills are also central to how NAPLAN is administered. The tests are time controlled, so speed is a major factor. Traditionally, teachers drill students in preparation for the tests, thus focusing on memorisation rather than developing understandings. Significant numbers of students find the tests extremely stressful, which is clearly not conducive to them performing well. Not unexpectedly, our students are failing to show improvement. In response, the Australian Government discussed introducing additional tests in 2018, an action that would compound the problem of over-testing. I strongly believe that NAPLAN would lose its attraction overnight if parents were also required to sit the test!

Pleasingly, from my point of view, NAPLAN and the *My School website* are not without their critics. **Radhika Gorur** and **Stephan Lewis** (2017) from Deakin University comment on how information gained from NAPLAN about individual students, classrooms and schools is too limited and error prone to be of use. Chief Executive of the Australian Council for Educational Research, **Geoff Masters** (2017) also supports changes to NAPLAN in order 'to place less emphasis on comparing the performances of schools and more emphasis on supporting student learning', as does **Tom Bentley** and **Glen Savage** (2017) who argue that NAPLAN and *My School* have not led to improvements in literacy and numeracy, with the data showing either stagnation or decline. The latter seems a particularly powerful statement considering that **Tom Bentley** was a senior advisor to the former Prime Minister and Minister for Education, Julia Gillard, who introduced *My School* and NAPLAN.

Our Federal Government's fixation on improving our OECD Programme for International Student Assessment (PISA) ratings may also need to be re-evaluated. Since 2006,

Singapore has been one of the top performers in the PISA testing program. Despite this, Singapore's education system has been criticised. **Rodney King**, in his book *Singapore's Education, Myth and Reality: A Reputation Deserved or Fabricated?* (2016) questions the city-state's claims to education excellence and examines the effectiveness of their pressure cooker education system. King's analysis of Singapore's education system is echoed by **Angela Jelita** (2017) in the *South China Morning Post*, who writes:

The country's school system is geared towards high achievement in exams, but the emphasis on rote learning and memorization, combined with pressure to succeed affects children's social skills, health and overall happiness.

▲ Jelita, *South China Morning Post*, 21 September

As evidence for this, Jelita cites the reported 27 suicides among 10 to 19 year olds in Singapore during 2015, although she also recognises that parental pressure, not just pressure from schools, is a significant factor in these deaths.

Anecdotes I have heard from visiting teachers from Singapore also raise questions as to the validity of the OECD testing program as a measure of a country's education system. In spite of their high OECD results over many years, when asked why they seek the help of Australian schools and universities in improving their teaching of mathematics, Singapore teachers invariably highlight the fact that very few of their students want to become mathematicians: their love of the subject has been 'drilled' out of them.

When considering the importance of OECD testing, it is pertinent to note Finland's attitude to such testing, as highlighted by **Pasi Sahlberg**'s comment in his interview with Bryan Bruce:

Finland has never really been too excited about PISA results. Not in the good days or the bad times. We don't think education is a global competition.

▲ Bruce, 26 May 2016, youtu.be/1w7CunvjvdE

Australia's teaching profession must also accept part of the responsibility for the state of education in our schools. Too many schools, as mentioned previously, have chosen to narrow their curriculum in order to satisfy State and Federal Governments' obsession with cognitive, academic outcomes. This has led to a devaluing of 'non-cognitive outcomes', described by **Dean Ashenden** as 'the values and attitudes that kids take from schools', highlighting how schools matter more to the social order than they do [to] 'the economy'. They help (or fail) to sustain the cohesive social order on which economic activity depends.
(Ashenden, 2018)

Too many of our schools have also chosen to adopt teaching practices that research has shown to be enervating to students' perception of themselves as learners. One of these practices is streaming. **Henrietta Cook**

quotes OECD findings that around 98 percent of Australian secondary schools use some form of streaming. Cook also quotes Professor **John Hattie,** who believes that the effects of streaming on equity is both 'profound and negative'. The 'Evidence for Learning' Toolkit compiled by Social Ventures Australia (SVA) refers to streaming as having a negative impact on learning, even though it continues to be amongst the dominant pedagogical approaches currently used in classrooms.

The use of data boards (aka League Tables) to publicise student achievement levels is equally damaging to the self-esteem of low achieving students. In my opinion, the following words of film producer and educator **Lord David Puttnam** about his own schooling is essential reading for all educators:

[U]nder-achievement most frequently stems from a lack of expectation as originally perceived in the eyes of others. A lack of expectation we come to accept as our reality, our fate.

▲ Puttnam, n.d.

Big data versus small data

Before concluding this segment, I believe it is pertinent to comment on the growing importance given to big data in Australian schools. **Pasi Sahlberg** and **Jonathan Hasak** argue that big data 'at best only reveals correlations between variables in education, not causality'. They also conclude that big data alone will not improve our system of education and affirm the importance of small data in uncovering huge trends.

> In education, these small clues are often hidden in the invisible fabric of schools. Understanding this fabric must become a priority for improving education.
>
> ‣ Sahlberg & Hasak, *The Washington Post*, 9 May 2016

The issue, as I see it, is not whether we should disregard big data in favour of using small data, although I do agree with Sahlberg and Hasak that small data is far more informative. Rather, we need to recognise that all data needs to be weighed against what we, the educators, know about our students and schools. **Tricia Wang** notes the famed Swedish statistician **Hans Rosling**'s annoyance with the widespread application of big data without 'thick data', or human insights. 'I'm not interested in data', he said, 'I'm interested in people and life' (Rosling cited in Wang, 2017).

The danger that I see permeating our profession is that increasingly teachers are regarding big data, in particular as gleaned from standardised tests, as the 'Holy Grail' of evidence, impervious to error. It is also pertinent when assessing the importance of standardised tests to consider what research says about their connection to students' future success. Nobel Prize-winning economist **James Heckman**, for example, has undertaken a study that shows that grades, which measure personality traits like grit and attention to detail, are better predictors of college success or in the workplace than IQ and SAT tests (Staley, 2006).

Unfortunately, the issue of big versus small data, and teacher assessments versus standardised tests is only one aspect of a much bigger problem of the ever-increasing volume of data educators are being asked to gather and process. The issue, I believe, is now mixed up with constant need for educators to prove their personal worth. For many teachers and school leaders, it consumes much of the school day previously devoted to educating students. Nor is such a problem restricted to Australia. Educators and parents around the world are battling with politicians to stop this 'datafication' of students and schools. For instance, the UK organisation morethanascore.co.uk is typical of such groups and well worth exploring, as are the writings of the US critic and commentator **Eric Donald Hirsch Jr** (2016), who describes US schools as 'soulless test-prep factories.'

Supposedly, advocates of GERM strive for higher standards, a goal that on the face of it is undisputed in education. Unfortunately, in our desire to achieve higher standards, educators have also impeded our students' passion for learning. **David Geurin**, a principal and prominent US education blogger, addresses this conundrum in his book *Future Driven*, writing about the need to rekindle students' passion for learning at a time when accountability has been prioritised to the detriment of everything else. 'If our students master every standard but do not discover joy and passion in learning,' he writes, 'we have failed them'.

Pleasingly, closer to home, the New Zealand Minister for Education **Chris Hipkins** has announced that his government will abolish their National Standards Program, arguing that the national standards are neither national nor standard (Cormick, 2017).

galactic
cosmic
radiation

aghhh!
i am ioniozing
out of control!!

← magnetosphere

[T]he very best of our teachers prioritise the nurturing of students' self-esteem and the building of students' thirst for learning in their classroom.

What are the underpinning principles of such a change?

The rapid advancements in technology, along with an ever increasing groundswell of disengaged students, is forcing many educators to question their pedagogical practice and rethink the existing culture of teaching. Enterprising governments and employers are increasingly searching for more than just literate and numerate employees. Creativity, critical thinking, communication skills and digital literacy are just a few of the twenty-first century skills our students need to live fulfilling lives.

Today's Generation Z students, born between 1995 and 2009, make up about 20 percent of Australia's population (McPherson, 2017). They are characterised as highly individual, entrepreneurial, globally connected, digital natives. The digital world is their playground, providing instant gratification and access to the world at large. However, a new generation of students is fast replacing Generation Z students in our primary schools. According to futurist and demographer **Mark McCrindle**, children born after 2010 are our Alpha Generation, and 2.5 million Alphas are born around the globe every week. **Christine Sterbenz** (2015) describes Alpha kids as never being without an iPad and smartphone, and being able to convey their thoughts online in an instant. Maintaining their interest at school, then, requires a real world, authentic approach to curriculum planning, along with a more personalised and differentiated focus when addressing individual student's needs. Creating such an environment must, I believe, include:

1

the recognition that the exponential growth of knowledge will require extensive changes to how we educate children

2

a curriculum that balances the cognitive outcomes learned at school with the values and attitudes students take from school

3

student agency established as a priority across the school

4

an emphasis on the development of entrepreneurial and enterprise skills

5

a strong focus on innovation to address the ever-changing nature of our world

6

ubiquitous use of ICT

7

the development of appropriate growth mindsets in our students

8

harnessing social media as an educational tool

9

a strong focus on collaborative, problem-based, enquiry learning

10

STEM subjects being given a prominence in the curriculum

11

less grouping of students according to age

12

team teaching, where groups of teachers truly share responsibility for the students in their care

13

a dramatic increase in the use of mentors, particularly from the ranks of our skilled retirees, to assist young students

14

ongoing professional development for all school personnel

15

an interdisciplinary approach to curriculum development, with prominence given to the sustainability of our planet, global citizenship, creativity and the arts

16
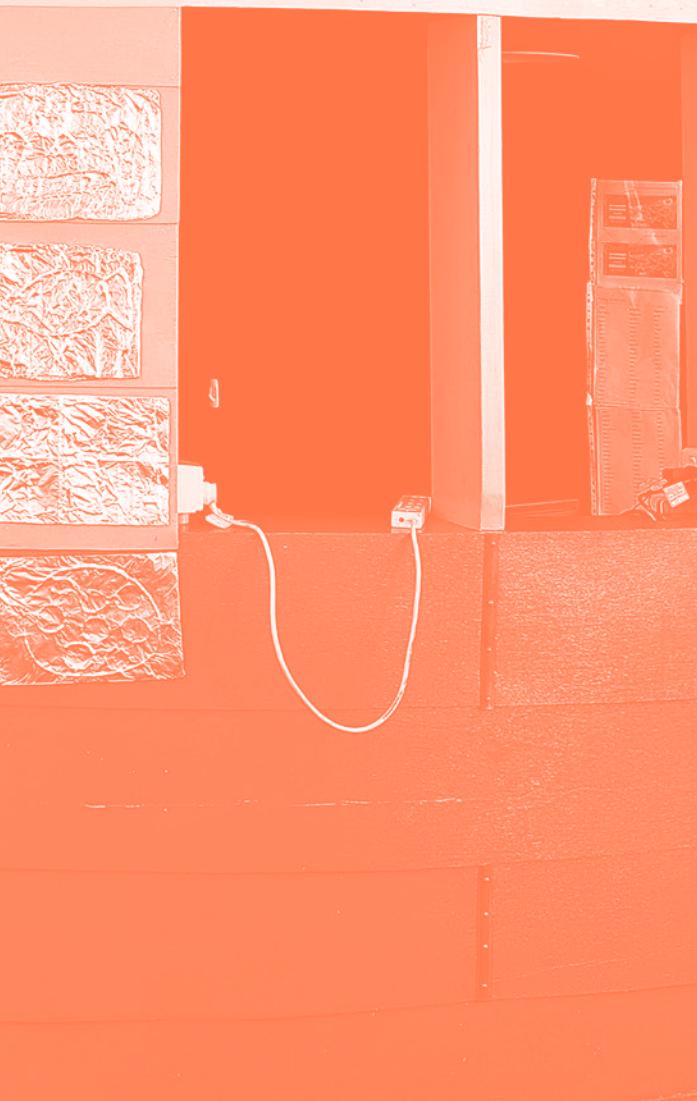
an increased focus on 'real world' learning, with a recognition of the importance of Asian literacy for the future of Australia

17

the teacher's role being expanded to include the roles of mentor, researcher, facilitator, student confidant, co-learner and co-creator of the learning, **while recognising that the very best of our teachers prioritise the nurturing of students' self-esteem and the building of students' thirst for learning in their classroom**

The need for a Raison D'être

In our hope to achieve such innovations at Wooranna Park, we have spent a great deal of time over the years as school leaders and teachers, defining our school's philosophical direction—its Raison D'être—outlining significant aspects of our school's beliefs about teaching and learning, its organisational structures and learning environment, along with the school's approach to curriculum, leadership and assessment. Without such a document, we would not have known the nature of teaching and learning across the school, or upgrade our practices as required.

To view the Raison D'être Document go to **http://wix.to/asBaDDw**

FIGURE 1.
**Creating a New Education Paradigm
—Our School's Journey**

Student Attributes

Collaboration
Citizenship
Communication
Creativity
Curiosity
Character
Critical Thinking

Pedagogy

Workshops
Learning Symposiums
Targeted Teaching
Learning Agreement Time
Layering the Learning—Surface to Deep Learning
Students as Teachers/Mentors
Literature Circles and Associated Projects
Student/Teacher Conferences
Enigma Missions
Socratic Forums
Team Teaching
Autonomous Learners Program
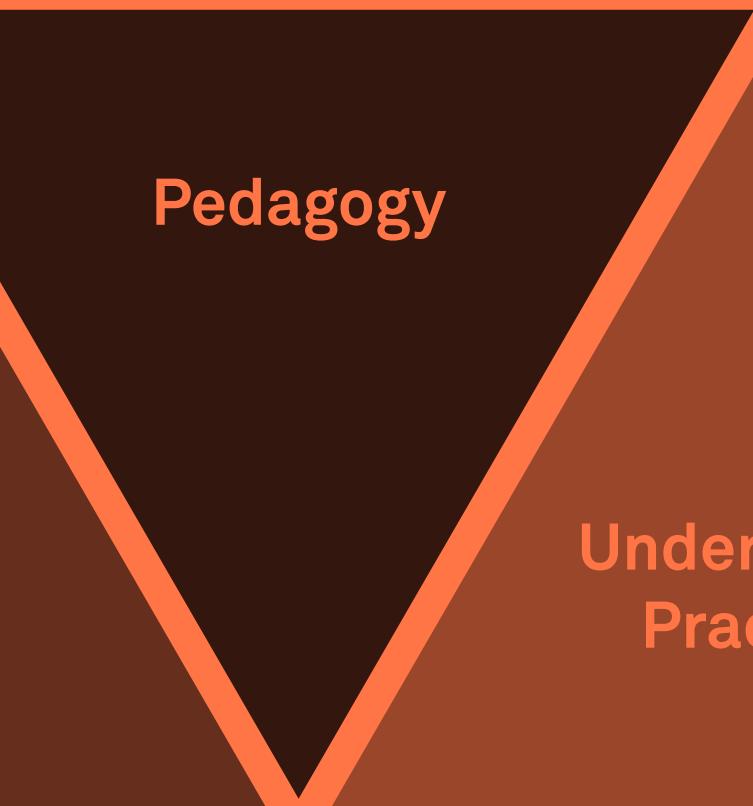
Underpinning Practices

Entrepreneurial & Maker Skills
Establishing Partnerships with Outside Agencies
Authentic Engagement in Real World Challenges
Interdisciplinary Studies
Personalised Learning
Application of Existing Knowledge
Differentiating the Learning
Using Learning Environment as the 3rd Teacher
Creation of New Pedagogies
Global Citizenship
Building a Thirst for Learning
Leveraging the Digital World
Mindsets for Learning
Student Agency
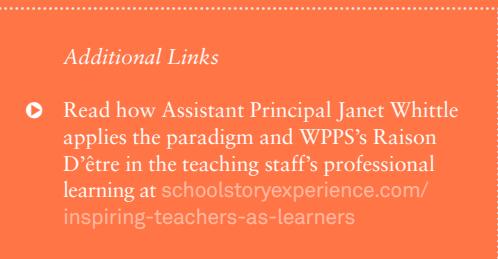
Student Attributes

Our Reason for Being

Pedagogy

Underpinning Practices

Schools as places of learning, not teaching

In 2006, I was invited to speak at a conference in Singapore, 'Teach less, learn more'. This was the first time I can remember attending a conference that openly challenged the dominance of teaching in the learning process. Since then, we have seen dynamic examples such as **Sugata Mitra's** 'Hole in the Wall' experiments that have demonstrated young children's capacity to direct their own learning.

Despite such experiments, there seems to be little appetite for rethinking the existing culture of teaching. Education theorists like **John Hattie** and **Richard Elmore**, with their focus on Visible Learning and Teaching Rounds have, arguably, further strengthened this culture in recent years. This is despite experts in the field of statistical analysis describing Hattie's work as pseudoscience (Bergeron & Rivard, 2017) and my personal discomfort with Elmore's perception of the 'master teacher', as displayed in film clips used to illustrate his theories.

This is not to argue that some teaching approaches are not more effective that others, or that teachers shouldn't be required to improve their teaching skills. Rather, I would suggest we should to be careful not to accept all of Hattie's work, without question. Particularly since Hattie's interpretation of data infers that 'giving students control of their learning', 'problem based learning' and 'inquiry based teaching', is of little or no value in the classroom! (Moore 2017) This is something I could not agree with!

Richard Elmore's work on giving and receiving feedback also needs to be reviewed with a critical eye. A recently published paper written by **Marcus Buckingham** and **Ashley Goodall**, titled 'The Feedback Fallacy' (2019), addresses the issue like this:

"Your brain responds to critical feedback as a threat and narrows its activity. The strong negative emotion produced by criticism inhibits access to existing neural circuits and invokes cognitive, emotional and perceptual impairment."

▲ Imbedded quote by psychology and business professor Richard Buyatzis accessed https://hbr.org/2019/03/the-feedback-fallacy

What makes effective feedback problematic in most schools is the hierarchical structure of schools. An alternative 'flatter' structure is outlined by **Aaron De Smet** et al for McKinsey & Company (October 2018) in 'Leading agile transformation: The new capabilities leaders need to build 21st century organizations'. It argues for turning away from viewing organizations as a static, siloed, structurally hierarchical machine-like thing that functions through linear planning and control. As the world becomes increasingly more complex, many organizations are recognising that they need to become more agile as their workers find themselves 'drowning in complexity'. The McKinsey paper describes agile organisations as:

"open, inclusive, and nonhierarchical, evolving continually without the frequent disruptive restructurings required in more mechanistic organizations; and they embrace uncertainty and ambiguity with greater confidence."

▲ De Smet, Lur ie & St George, 2018, p.5

The majority of schools function on the hierarchical organization model, with each level of leadership answerable to the level above. This contrasts with the 'flat model of management' considered more appropriate

to address the changing nature of work in the 21st century. Buckingham and Goodall (2019) views on effective feedback seem particularly pertinent in this respect:

"We humans do not do well when someone whose intentions are unclear tells us where we stand, how good we 'really' are, and what we must do to fix our selves. We excel only when people who know us and care about us tell us what they experience and what they feel, and in particular when they see something within us that really works."

▲ Buckingham & Goodall accessed https://hbr.org/2019/03/the-feedback-fallacy

However , there may be more serious implications associated with both Elmore and Hattie's work, as educators apply their methodologies to further bolster a culture of teaching in our schools, rather than a culture of learning. A culture of teaching projects the learner as a passive recipient of the learning, while a culture of learning portrays the learner as an active participant in the search for knowledge.

A learning culture

Recently many schools, including WPPS, have adopted a list of 'C' words to define the attributes needed for our students to live fulfilling lives: collaboration; citizenship; communication; creativity; curiosity; character and critical thinking. **Will Richardson** (2017b) argues that if you want students to become proficient with these attributes, you have to have a culture that supports that type of work. Not just any culture, a learning culture—one where everyone, teachers and students—see themselves

as learners. Richardson sums up his thoughts on the subject with the following words:

[T]eaching cultures don't sustain innovation. They don't support curiosity or creativity. They don't demand real world problem solving that requires critical thinking. Only learning cultures do that, ones where the educators are curious and innovative and solving real world problems just like kids.

▲ Richardson, 2017

It is also pertinent to clarify what Richardson means by 'learning'. Recently, I attended one of his presentations, where he asked his audience to define the word. The small dictionary that lives on my desk gives two definitions: 'the act or process of acquiring knowledge or skill' and 'knowledge acquired by scholarly study.' Having watched Richardson's 2015 TED Talk numerous times, I knew that he was looking for a definition more in keeping with the quality and impact of the learning needed in our schools. As expected, he was soon introducing one of his favourite mentors to the audience, Yale University Professor of Psychology, **Seymour Sarason,** along with the professor's definition of 'productive learning':

Productive learning is where the process engenders and reinforces wanting to learn more. Absent (of) wanting to learn, the learning context is unproductive.

▲ Sarason cited in Richardson, 2015

A culture that acknowledges the future

Previously, I raised the issue of schools still using antiquated practices that were originally designed for a different social and economic time. In the preface to his 2016 book *Stop Stealing Dreams (What is School for?)*, **Seth Godin** (2016), US author and former dotcom business executive, praised the Harlem Village Academies School (HVA) as the kind of school needed for our times:

HVA is simply about people and the way they should be treated. It's about abandoning a top-down industrial approach to processing students and embracing a very human, very personal and very powerful series of tools to produce a new generation of leaders.

▲ Godin, 2016, accessed at medium.com/@thisissethsblog/ stop-stealing-dreams

The vast majority of parents would, I suspect, expect that their children be treated similarly. Yet Godin is highlighting this as an exception to the rule. If we ignore the colourful furniture and technology present in our schools today, we would find that most schools are not that different from the schools our students' grandparents attended. Too many of our schools have not chosen to transform their teaching and learning practice—and are unlikely to adapt in the future—in order to prepare our students to address an ever-changing world.

   Consider this. Most educators around the world are mandated to teach a curriculum primarily based on acquiring skills and knowledge to prepare students to live fulfilling lives—however, much of these skills and knowledge is consistent with the studies our

students' *parents* learned when they were at school. The prediction that knowledge will likely be doubling every 11 to 12 hours (Schilling, 2013; Rosenberg, 2017) is made more complex by how quickly it will take current knowledge to become outdated, incorrect or irrelevant. **Mark Rosenberg** points out that one measure of knowledge is its half-life, the time it takes to lose half its value.

For many content domains, especially in science, technology, R&D, marketing, and even finance, the half-life of knowledge is shrinking. Information that 10 years ago was useful for 12 months might only be valuable for 6 months today.

▲ Rosenberg, 2017

It is Rosenberg (2017) who coins the phrase of a *knowledge tsunami*—'a seemingly unstoppable wave of new information pushing you forward, combined with an extremely forceful undertow of information that used to be valuable but is now just knowledge clutter, pulling you back'.

   John Seely Brown and **Douglas Thomas** also address this situation in their book *A New Culture of Learning. Cultivating the Imagination: Building Learning Environments for Innovation* (2011).

For the last 200 to 300 years, the primary concerns in education had been with skill efficiency and scalable efficiency, that is how to op-timise the transfer of expert-generated knowledge to students, even across a

nation. However, the world is moving into a state not of fixed essence but of constant flow. In this world, much of the knowledge that is created is tacit because there is no time for it to be distilled, encoded and communicated before the next shift happens. This greatly challenges the relevance of standard pedagogies that have to do with explicit, rather than tacit, knowledge.

▴ Brown & Thomas cited in Richardson 2017

Richardson summarises the implications of Brown and Thomas' work for educators as follows:

What that means, in essence, is that memorising knowledge that has been codified over time is increasingly an irrelevant effort in a moment where the half-life of that knowledge is getting shorter by the day. An emphasis on texts and facts in school, that stuff that has been made explicit over time, will not serve students as well as developing their ability to tap into the tacit expertise that individuals accrue in their day to day dealings in the actual world, not in the past. That means an emphasis not on standard curriculum as much as it means building literacy in connecting, creating, and curating within the global networks and communities that we now have access to online. It's a move away from learn by reading and memorization, to learn by doing.

▴ Richardson, 2017 accessed https://modernlearners.com/the-changing-nature-of-knowledge/

It is perhaps pertinent to remind readers here, as Rosenberg does, that **Alvin Toffler** warned us of the effects of this knowledge tsunami when he wrote in his book *Future Shock*, published in 1970, 'the illiterate of the 21st Century will not be those who cannot read and write, but those who cannot learn, unlearn and relearn' (Toffler cited in Rosenberg, 2017). Many of our more traditional schools will find such a change difficult to implement!
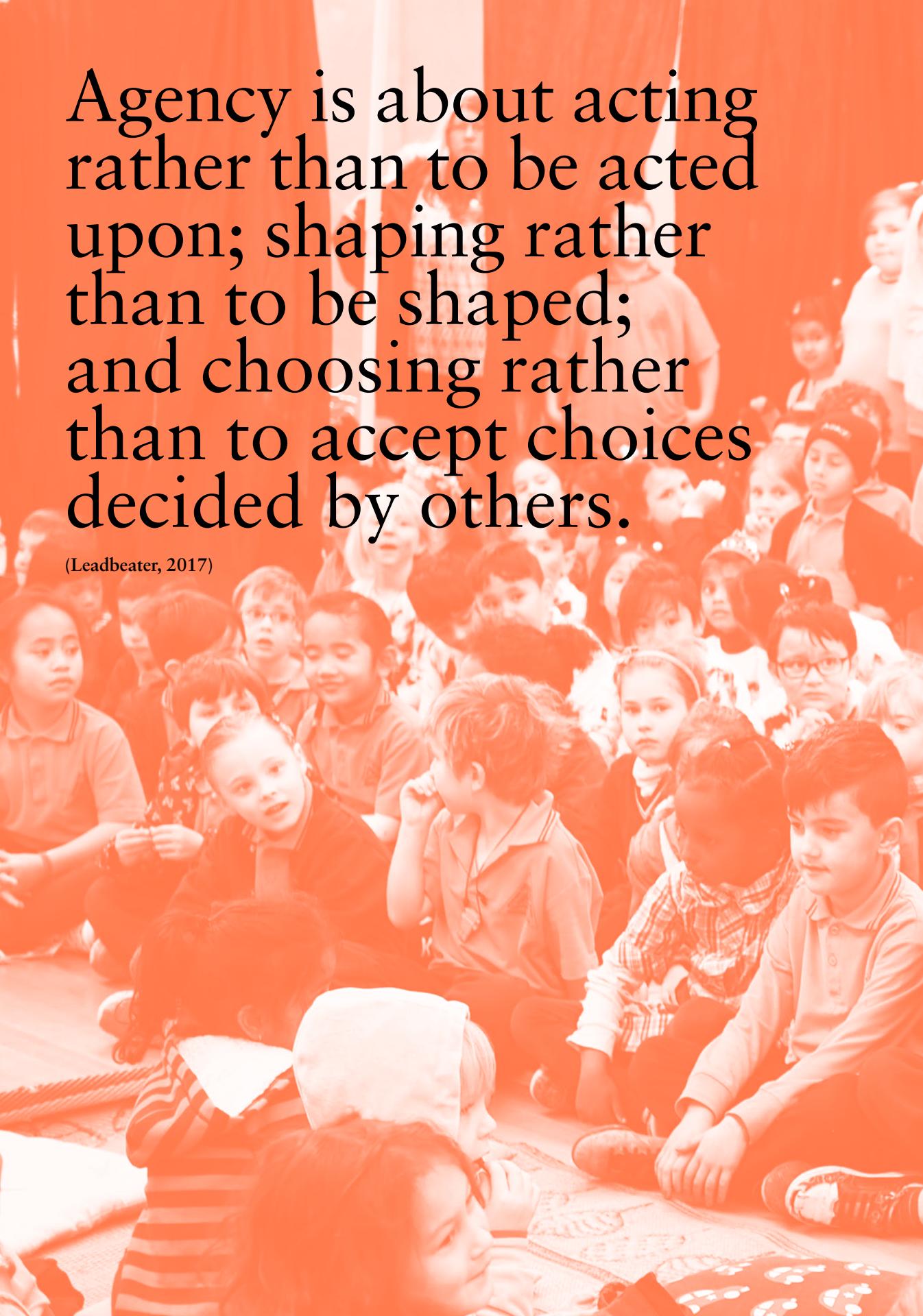
Informal, non-hierarchical and 'open' learning

In grappling with how we might transform our schools in the future, I am drawn to the writings of education futurist **David Price** (2013, 2015). Price argues that children's learning in school is increasingly different from the learning they acquire outside of school, where the learning is informal, social, non-hierarchical, unsupervised and 'open'. This is in stark contrast with the highly structured and directed nature of learning (or, more accurately, teaching) in most schools. The pedagogical re-orientations Price describes between formal and informal learning have been very much in mind as we have sought to transform our classroom practices at WPPS.

This detachment (between school learning and learning outside of school), I believe, is reaching a crisis point, whereby the consumers and stakeholders involved in formal learning are actively looking to informal solutions. The grades that individual students receive for their school projects matter little compared to the comments found of their blogs, or their Vimeo accounts. Rising numbers of parents, frustrated by the worksheet culture of their child's classrooms, are self-organising and co-creating local home-learning networks. Teachers are taking to Twitter and TeachMeets to create informal self-help professional learning networks. (Price, 2015)

Agency is about acting rather than to be acted upon; shaping rather than to be shaped; and choosing rather than to accept choices decided by others.

(Leadbeater, 2017)

How have our teachers and students implemented these changes?

Transforming a school does not happen overnight, and schools interested in challenging the educational status quo need to be aware of how difficult this task may become. John Hagel, a management consultant who assists executives to address emerging business opportunities and challenges, contends that every large and successful institution has an immune system—'a collection of individuals who are prepared to mobilise at the slightest sign of any "outside" ideas or people in order to ensure that these foreign bodies are neutralised' (2017). He points out that in rapidly changing times, if much-needed changes are not implemented, this same immune system can lead to the death of the institution. This is a situation, I would argue, our profession is fast approaching today.

It is also important to note that the knowledge tsunami discussed previously will increasingly require educators to focus children's learning on *real world action, collaboration, reflection and verification*, if students are to be proficient life-long learners, able to *learn, unlearn and relearn*. The strengthening of school–industry partnerships, raised earlier, will be another important factor in allowing students to experience real world learning.

For WPPS, transforming our school has taken place over more than two decades and there is still much more to be accomplished. Our journey at times has been a lonely one, as many of our professional colleagues—consistent with Hagel's warning—do not share our commitment to creating a paradigm shift. Thankfully, we have been able to learn from the writings and presentations of a host of distinguished educators, and use these learnings to inform our journey. Educational theorists like Yong Zhao, Valerie Hannon, Ken Robinson, Pasi Sahlberg, David Thornburg, Bob Pearlman, Andy Hargreaves, Stephen Heppell, Will Richardson, Michael Fullan, Elliot Washor, Sugata Mitra, Bruce Dixon, David Perkins, Charles Leadbeater and many others, have been our silent partners on this journey. Their wisdom has broadened our thinking and provided theoretical and practical evidence that supports our innovations.

Learning communities and personalised student learning

Early in our journey, the school leadership team recognised that we needed to document our journey for parents and future staff. As a result, our website has a wealth of film explaining our pedagogical practices. In 2014, the school completed a series of thirteen videos focused on our approach to Personalising Student Learning. These videos were subsequently translated into Spanish by Sister Monica from the College Montserrat in Barcelona. I mention these videos here, because much of what is described is still pertinent today and provides the thinking from which many of our recent innovations have evolved.

Our first task was housing all of our students together in 'learning communities' under the direction of a team of teachers, with each teacher given the added responsibility for shaping the learning journey of around twenty students. Much of our energy and time initially was devoted to redesigning the learning environment, a focus that continues today. During this initial period of innovation, we sought to personalise student learning within a collaborative framework influenced by Reggio Emilia philosophy, and focused it primarily around four pedagogical practices:

1. *workshops*: traditional, large-group presentations focused on specific subject areas, or broader interdisciplinary learning themes
2. *targeted teaching*: small-group teaching sessions designed to address the individual learning needs of selected students
3. *student–teacher conferences*: short weekly meetings designed to co-plan and differentiate each child's learning
4. *learning agreement time (LA)*: for younger students, LA is about providing small provocations to inspire students' learning and allowing them to explore the various learning centres that comprise their learning community. For older students, on the other hand, LA is about them increasingly taking responsibility for their learning, as they negotiate their independent studies with their teachers and undertake collaborative or personal inquiry or problem-based projects.

The decision to continue grouping our students primarily based on their age has been somewhat problematic. We recognise that age is not a good indicator of learning growth or potential, and that even if teachers are highly cognisant of the need to provide a differentiated learning program, grouping by age can prove less than ideal for some students. Grouping by age does, however, provide a social structure conducive to building learning communities that can grow and 'flower' over the course of our students' primary schooling. To address the limitations of this type of grouping, we are encouraging older year level learning communities to bond with younger learning communities nearby, while also encouraging talented younger students to participate in learning activities designed for older students. This requires our teachers to be extremely mindful of their students' interests and capabilities, along with the breath of learning taking place across the school.

Additional Links

View how students 'flower' from prep onwards through Prep Professors at
▶ youtu.be/cA1DnR1jCFs

Read teacher Jess Waters interview at schoolstoryexperience.com/learning-from-prep-professors

Enigma Missions

In 2015 I received an email from the American educator, David Thornburg, requesting some photographs of our school to include in a book he was writing, *From the Campfire to the Holodeck*.[4] Thornburg argues that from primordial times humans have learned in four discrete ways: at the campfire, at the watering hole, in the cave and from life—metaphors for direct teaching, collaborative learning, learning from oneself (through reflection and introspection) and building on one's learning in the course of your daily life. He also created fifty short videos to excite students' learning,

a program he called 'Knights of Knowledge', and built a holodeck in Brazil where older students could experience life on board a spaceship destined for Mars. As a principal who believes that schools should be as exciting as Disneyland, I was immediately hooked.

In response, we started to prepare our own films to excite our students' learning and challenged our students to undertake 'Enigma Missions' to solve the conundrums and mysteries of life. We also built a new learning space, which we called the Enigma Portal on the recommendation of one of our students. Unfortunately, our plans were hindered, in part, by our inability to produce films quickly, a significant task given the multitude of topics in which students expressed an interest. It was at this point that my Assistant Principal in charge of the senior school, Jennie Vine, resolved our problems and laid the foundation for many of our more recent pedagogical innovations.

Jennie recognised that it was not essential that we prepare films to excite students' learning. She used students' innate curiosity, along with her worldly knowledge and teaching skills, to introduce students to a number of next-practice pedagogical practices. Our subsequent involvement in the AITSL Learning Frontiers Program, led by Valerie Hannon, along with our inclusion in Michael Fullan's international research project, 'New pedagogies for deep learning', helped solidify these innovations. The following infographic, 'Creating a new education paradigm: Our school's journey', summarises where we are today relevant to our underpinning practices, pedagogy and student attributes. *(See Figure 1—Page 30)*

Enigma Missions as a pedagogical practice were dramatic in their impact. From day one of our journey to transform our school, one of our goals has been to increase students' ownership of their learning. But the increased levels of student agency that resulted from the introduction of Enigma Missions was beyond our expectations, as was the quality and advanced nature of student learning.

We soon learned that students' interests extended well outside the normal primary school curriculum, and this presented a dilemma. Should we allow our students to explore and have an impact on social issues they felt strongly

about? Should they learn about black holes, DNA, autism, de-extincting animals, the God Particle, or how the brain works? We chose to allow our students to select their own Enigma topics, although some of the students' choices needed to be modified to avoid culturally sensitive issues, or placing them in danger, e.g. exploring homelessness on our city streets. It is also interesting to note that a number of the topics students chose to focus on had their origins in the Socratic Circles held at the school.

It wasn't long before our Enigma Missions began to influence other areas of the curriculum and in particular the Year 5 & 6 literature studies. The following infographic 'Literature as a Catalyst for Research and Deep Learning', *(See Figure 2—Page 44)*, tracks the ease through which the concept of Enigma Missions morphed into the ideal medium for students to research and respond to an author's deepest thoughts. Three short videos are available on the school's website: 'Enigma Missions—Student Voice', 'Enigma Mission Evolved' and 'In Search of Deep Learning'. Professor Michael Fullan has shown these videos around the world to educators involved in the 'New Pedagogies for Deep Learning' project. In late 2018, four films featuring the schools innovative approach to learning were produced by the George Lucas Foundation. This was quite an honour for our school, since WPPS is only one of three schools filmed by the Foundation outside the United States.

Additional Links

In 2019, the George Lucas Foundation published documentary films of Wooranna Park Primary schools entitled:

Passion-Driven Research Projects
▶ t.ly/WYKe

Connecting Public Speaking to Critical Thinking
▶ t.ly/AjCp

A Student-Driven Approach
to Experiential Learning
▶ t.ly/kgbG

Sparking Curiosity with Self-Directed Learning
▶ t.ly/AeTz

FIGURE 2.
Literature as a Catalyst for Research and Deep Learning

1

Teachers started with the literacy texts (part of the existing English curriculum) and picked the overarching theme of interdependence (part of collaboration)

Teachers introduced a choice of texts; *The Happiest Refugee, The Power of One, The Hunger Games, I am Malala, The Giver, A Wild Wood*

Teachers ran traditional 'surface?' literacy activities. Students and teachers discussed and wrote about the characters, type(s) of text?, sequence of event, settings etc.

— Deepening →

Pedagogical Approaches
Socratic Circles
Specialised Elective Workshops
Live Student-led Forums/ Symposiums
Learning Agreement Time (Independent Learning)
Small Group Explorations
Mixed Classes

2

Teachers deepened the learning by introducing interdisciplinary themes across all six texts.

Students explored deeper cross-text themes of

Racism	Slavery
Government structures affecting change	
People making a difference (+ive/-ive)	
Historical Events	

— Deepening →

Pedagogical approaches
Immersion videos discussions
Provocations (oral/written)
Excursions and incursions
Learning agreement time

3

Teachers deepened the learning by providing opportunities for students to make connections and explore different perspectives.

Students began to make connections to their own lives/ experiences and to prior learning/ readings, and to incorporate difference perspectives.

Pedagogical approaches
1:1 teacher/student conferencing
Student-initiated connections with experts/community
Learning agreement time
Peer conferences

— Deepening →

4

Students began to deepen the learning by identifying their own Enigma Mission topics and how they may action them in their local communities.

Students identified an Enigma mission project and possible action they may take (made connections to the wider community/experts).

2015 Enigma Projects

Homelessness in Dandenong	Breaking the young mums cycle
Teaching Afghani migrants English	Equity for North Korean women
Living conditions of refugees	Awareness of early detection of cancers

— Deepening →

Pedagogical approaches
Autonomous licence
Student-led portfolios/student-made films
Use of peer reviews to strengthen rigor of projects
Feedback from the wider school community
Final presentation to a panel

5

Students were afforded independence and the opportunity to demonstrate broader life skills and dispositions, influence others and take action in their local communities.

Students demonstrated understanding through authentic research and student-led action

2015 Enigma Actions

Students volunteering in local soup kitchens	Students running English lessons for Afghani migrants
Students leading petitions to change North Korean women's rights	Students develop films raising awareness of the living conditions of refugees.

Learning Symposiums

It is also important to understand that the Enigma Missions were not an exercise in surface learning. Nothing could be further from the truth. As a former secondary school teacher, Jennie expected students to provide a bibliography detailing their research sources, contact experts for additional information and be prepared to present their findings to, and answer questions from, their peers, teachers and parents. She also recognised that the students' learning needed to be 'layered' in order for them to move from surface to deep learning and share this learning with their peers. This led Jennie to introduce a new pedagogical practice called 'Learning Symposiums'.

Learning Symposiums promote student ownership, autonomy and collaboration, shifting student knowledge from short-term to long-term memory. As in a Q&A forum, audience members in a Learning Symposium have a specific task. They must interrogate the student presenter respectfully, probing the depth of their knowledge throughout their presentation. Prior to the experience, teachers ensure that all members are aware of questioning technique, etiquette, social conduct and expectations.

Students complete their presentations without using cue cards, after which they are expected to note the areas of weakness in their research. They are then set the task of addressing research gaps, oversights and inaccuracies before the next Symposium, where they will represent their project. The chance to reassess and represent their research encourages accountability and promotes purpose.

Learning Symposiums are not age specific and require mixed audiences made up of students, teachers, parents, professionals and community members. They encourage the cross pollination of knowledge, building new thinking pathways, and broadening and deepening existing understandings or perspectives. They also provide teachers with an opportunity to audit the project-based learning taking place at the school against the Victorian Curriculum. Teachers require considerable skill, supervising student research while at the same time identifying learning outcomes on the Victorian Curriculum which need to be covered. They must be prepared to stretch their own understanding, embracing research and the cross-referencing of students' work, authenticating what has been presented, all while allowing students to explore their learning outside traditional boundaries. We are now working with other year level teachers to modify Learning Symposiums for use with younger students, as we do with much of the next-practice pedagogy introduced into the Year 5 and 6 learning community.

A more recent innovation to the Symposiums is the introduction of an 'orange card'. Orange cards are flagged when the student presenting has exhausted his/her core evidence and has entered what we call the 'impulsive/emotional dialogue zone'. This is when the presenter becomes emotional and tries to defend themselves in order to persuade the audience to buy into their thinking, rather than focusing on facts. At this point, the presenter has to record the point of view of the student who has challenged them, conduct further research to address the question, then report back within a fortnight. This way, deeper discussion can transpire. This process of acknowledging and facing challenges is quite transformative in nature, as it can not only change the thinking of the presenter, but that of all participants who eagerly await the next instalment of carefully analysed data.

Teachers have also adapted the use of Learning Symposiums to include Maths Symposiums. This involves groups of students being asked to solve mathematical problems and report their solutions to their peers in the Symposium format. In providing differentiated solutions to problems, students generate in-depth discussions of mathematics that build on their existing knowledge. In response to this increased use of Learning Symposiums as a pedagogical practice, we have built a tiered seating area where the Symposiums can take place. The tiered seating is arranged as an intimate amphitheatre to support the discursive practices of the Enigma Missions inquiry processes.

[T]hey want to develop the skills to navigate their own learning —to explore and make choices that unlock their curiosity and potential.

(Microsoft and McKinsey & Company)

Autonomous Learner Cards

Another successful pedagogical practice for the school has been the 'Autonomous Learner Card' (AL Card). This program is about encouraging all students to recognise themselves as autonomous learners. The Card allows Year 5 and 6 students to work outside the confines of their learning community. To obtain an AL Card, students have to write a formal application addressing a list of questions that relate to their ability to work and learn unsupervised. They are also required to attend an application interview with a panel comprised of students and teachers.
If successful, they are given a two-month trial. On the successful completion of the trial, applicants are formally recognised as Autonomous Learners at a meeting of the Student Parliament. The Autonomous Learner Card concept has been also successfully introduced to Year 3 students.

Students as teachers and mentors

The adoption of the simple pedagogical practice of encouraging all students to see themselves as teachers and mentors, passing on their expertise and wisdom to other students, has also proven extremely beneficial. Jessica Langer, writing for the Harvard Graduate School of Education's 'Usable knowledge' blog, comments that

allowing her high school students to teach their peers sends a powerful message to her students: 'You have knowledge worth sharing, you have a teacher's trust, and you have an opportunity to support your friend's learning' (Langer, 2016). For WPPS the program has also proven beneficial in other ways. First, it can be adapted for all year levels, with our Prep Professors program proving a resounding success and second, it has been used very successfully to socialise some of our high functioning autistic students. Seth, one of the students in question, is Singaporean and as such started his schooling in Singapore, where he was unable to adjust to the compliance-centric learning environment. His father searched the web for a more supportive setting and enrolled Seth at WPPS, where his talent with all things digital proved the ideal vehicle for his socialisation with other students. I still remember vividly when as a Year 1 student he was asked whether he could teach Year 3 students the software program 'Spore'. He paused and thought very seriously for a number of seconds, before thoughtfully replying, 'I … think … I … can … make … it … simple … enough … for … them'. In 2018, Seth and his family were featured by the Singaporean TV Station Channel 5 as part of a four part series on child prodigies. The film featuring Seth has had over 5 million views on Facebook.

Entrepreneurial and digital skills

WPPS also emphasises the development of students' entrepreneurial skills and ability to leverage the digital world. Students are encouraged to apply for loans from the Student Bank to establish start-up businesses. The bank is managed solely by the student leadership and financed via a grant from the

school council. Profits raised after repayment of the loans are split evenly between worthy social causes and the Year 6 Graduation Class. This allows our exiting students to purchase a gift for the remaining students to commemorate their association with the school.

This program expanded to the point that at the start of the 2020 school year, a decision was made that students capable of running their own business would be encouraged to do so. As such, these students would be able to keep any profits they made, after paying back any loans they had received from the school. The first student selected, already had a flourishing website design business. However, to our surprise the COVID-19 lockdown, requiring students to learn from home, produced two more budding entrepreneurs. One, a Year 5 student who started up his own mechanical keyboard business for gamers. The other a Year 3 child who was selling jewelry that he made. The latter was finding it hard to keep up with the demand.

Through being connected and encouraging students to explore the digital world, the school has discovered that students have more access to knowledge and advanced learning capabilities than ever before. Students have developed everything from virtual reality games and custom built computers to fully functioning Cisco networks (tertiary level studies). They have built their own 3D printed computer lab from Raspberry Pi's, their own cryptocurrency (woorannacoin), voted on hardware & software for the schools open-source steAm centre, built their own full nodes for various blockchains, and more recently they have created an education game that teaches you how to mine Bitcoin (cryptocrisis). They have even created a Minecraft environment to learn about hardware wallets and financial literacy. Recently students interviewed technologist **Andreas Antonopoulos**, and they are now working on a platform that has its own consensus of content algorithm, a student driven esports academy, a student lead certification program, and they are developing the website for the 2021 Thinking Conference which will be held in Melbourne.

In embracing the digital world, the school has discovered that some students have skills in this area that are more advanced than ever expected of primary school-aged children! Students have become the driving force behind these programs, as they traverse a multitude of digital terrains without fear of failure. There are numerous videos on the WPPS website featuring our approach to digital learning.

In introducing our students to the digital world we have learned not to purchase digital equipment inconsistent with our determination to create a new education paradigm. For many schools, ICT has only served to reinforce the status quo. David Thornburg alerted us to this problem when commenting on the use of interactive whiteboards and clickers in schools. The problem is that 'this technology operates on the assumption that the best way for students to learn is for teachers to stand and deliver presentations' (2013). The limited use of social media in schools is another example of the status quo prevailing. For most children, social media dominates their lives out of school. Yet the dangers associated with students using this often intrusive medium has prevented many schools from using social media to support children's learning. In avoiding social media, these schools fail to avail themselves of opportunities to more effectively link students, parents and teachers in ways never before possible. The introduction of the *SeeSaw* app to provide our parents with real-time glimpses into their children's school day highlights the importance social media can play in involving parents in their children's learning.

In contrast with many schools, WPPS has not introduced a one-to-one program, preferring instead to adopt an 'agnostic' approach in order to encourage our students to learn to use a variety of operating systems. This, in turn, allows our students to bring from home a wide variety of equipment to use at school. (WPPS is seriously considering the use of smartphones in our older year levels.) We are also careful not to focus all of our attention on developing our students' coding skills, preferring instead to include networking, game making and computer making in our list of school priorities.

The school's Education Technologists, Kieran Nolan and Tom McGann are also

involved in a number of future-oriented research projects designed to use cutting-edge technology for educational purposes.

An outline of these projects—RocketShoes.io (a web 3.0 tool for student ownership) a 24/7 learning environment in Minecraft, an international Virtual School in Mozilla Hubs, a web3 index of tools for schools. Cisco Education, Blockchain Education, LBRY Blockchain project, a digital financial literacy program, AR/VR art development program, a consensus of content algorithm and esportsedu.academy—is given in the Appendix.

Additional Links

Videos showing the application
of technology at WPPS
▶ Minecraft t.ly/60EW
▶ Coder Dojo t.ly/cWqk
▶ Cisco t.ly/NbiY

Interview with Education Technologist Kieran Nolan at schoolstoryexperience.com/digital-education-is-so-much-more-than-coding

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Stimulating Learning Platforms

As mentioned earlier, since 1997 WPPS has sought to create a learning environment for our students and teachers that supports our pedagogical beliefs, and despite limited funds and a school design hardly favourable to such a goal, we have succeeded in creating an indoor environment recognised for its creativeness and individuality. The building of 'Stimulating Learning Platforms' (SLPs) at WPPS has allowed teachers to tap into children's imaginations to create learning environments that despite their imaginary nature are very authentic to children and highly experiential and interdisciplinary. These environments are often launching pads to further experiences. They also acknowledge the importance of children's creative play in supporting their learning.

Examples of SLPs are the Prep Bus and Castle, the Dragon Boat and Spaceship in our Year 2 and 3 learning communities, and for older students there is the Enigma Portal—our school's digital learning hub. SLPs offer new

and exciting ways for students and teachers to conceptualise learning and to create problem solving situations, and are designed to elicit new understandings. This raises the possibility that the design of schools in the future may be significantly more interactive, as school planners capitalise on new technology to provide authentic experiences for students by way of highly interactive, virtual and augmented experiences.

In recent years the school has established additional SLPs: a Music Room, a Robotics Room, an Environmental Science Room and a STEAM Centre made out of four shipping containers. The latter features an outdoor Makerspace, Science Area, Networking Room, Virtual and Augmented Reality Areas, along with areas focusing on 3D Printing and Game Making. The school also hopes to establish a Holoportation Centre when it is financially viable.

Additional Links

View WPPS approach to the learning environment
—'The Third Teacher' at ▶ t.ly/EyEF

Read teacher Liz Moroney's interview of her teaching experiences in Spaceship SLP with Year 3/4s at schoolstoryexperience.com/creating-a-learning-community

Short videos show other learning spaces for
▶ Robotics t.ly/PKjd
▶ Environment Science t.ly/qwiG
▶ Performing Arts t.ly/lzwk

Prioritising student agency

Two tenets have underpinned our journey over the past two decades: 'change the system not the child' and 'do things with children not to them.' Keeping faith with these tenets would seem an easy task, but it is far from easy! Even the best of my teachers will at times send their students to me to be admonished, without fully listening to their stories. And almost daily, teachers are confronted with the latest government system, newly released literacy program, or a directive from their school's leadership team, with some form of system to

be implemented. Many of these systems are entirely appropriate, but many lack the structure to differentiate learning for students, requiring the student to meet the needs of the system, rather than the system meeting the needs of the student. As such, it is important that teachers reading this book recognise that they need to adjust each of the pedagogical practices outlined above according to the needs of their students and the flow of the learning taking place. In doing so, they would allow each learning experience to determine its own path.

As you may have already ascertained, central to the pedagogy outlined is the concept of student agency. Renaissance.com describes student agency as 'learning through activities that are meaningful and relevant to learners, driven by their interests, and often self-initiated with appropriate guidance from teachers (Renaissance.com, n.d.). Surprisingly, student agency is not well understood by many educators. A recently published paper by Charles Leadbeater looks more deeply into the role student agency plays in preparing students to shape their future. Leadbeater's paper stems from his work as an advisor to the OECD Education 2030 project and explores the origins, development and benefits of student agency in today's schools. His depiction of agency reflects powerful forces not present in Renaissance.com's description:

Agency is about acting rather than to be acted upon; shaping rather than to be shaped; and choosing rather than to accept choices decided by others.

(Leadbeater, 2017)

Some educators regard student voice as synonymous with student agency. While student voice is certainly a component of student agency, it is not student agency. Other educators see student agency as a form of child centred education. Leadbeater rightly points out in his paper that 'agency requires students not just to make choices but to make

investments in pursuing their goals' (2017). It is this willingness by students to personally invest in their learning that makes student agency such a potent and productive aspect of their education. Figure 1 presented earlier on page 30 includes a reference to 'Building a thirst for learning' as one of WPPS's underpinning philosophical practices. If there is a 'Holy Grail' of teaching, I cannot think of a more fitting achievement than building a thirst for learning in our students. Central to achieving such a goal, I would argue, is the introduction of student agency at all levels of schooling.

There will be educators who would be appalled at our decision to allow primary school students such a strong voice in what they learn, along with our willingness to embrace a less hierarchical and 'one-size-fits-all' approach to student learning. Students want to learn topics that engage and challenge them. Perhaps even more importantly, they want teachers to value what they have to say! Yes, there are aspects of the curriculum that are appropriate for all students to learn; but it is equally important that we accept that not all students are good at the same things. **Yong Zhao** (2016b) tells us that we should 'run away from our weaknesses' and focus on enhancing our individual human talents. While I strongly agree with the need to enhance the individual talents of students, I do not believe in defining boundaries for students' learning, particularly for young students. Only recently, one of my colleagues commented that his son hated reading—until he started to read the Harry Potter books!

It is, however, likely that I am doing Zhao an injustice by interpreting his words out of context, as in the introduction to his latest book, *Reach for Greatness* (2018), Zhao highlights our profession's obsession with finding deficiencies in children's learning. This focus, Zhao points out, is often detrimental to the development of children's strengths, as we spend most of our time treating their weaknesses. He describes this approach as 'Deficit–Driven Education', and notes that this is focused on closing the gap between privileged and underprivileged students. He observes, however, that this paradigm

is 'not likely to bring about social mobility for the traditionally under privileged' (2016b).

Finding relevance

Earlier, I raised the issue of student disengagement by quoting two frequently asked questions by secondary school students. I should have included a third question, 'Why do I have to learn this?' Clearly, the high rate of student disengagement requires changes to how educators develop and deliver the curriculum for today's students. Central to this is the need to develop a more personalised approach to curriculum development and central to this, is the issue of *relevance*.

Like many educators, I have a number of treasured documents that I refuse to discard. One of these documents is a paper written by Elliot Washor and Charles Mojkowski, 'Perspectives on relevance and the quest for rigorous student learning'. It tells the story of Ed Ames, who as a young boy grew up in a fishing village, wanting to be a fisherman. His father considered him too small and frail for such a job and sent him off to school, where he merged his love of fishing and science to become a distinguished marine biologist. Washor and Mojkowski argue that every learner is an Ed Ames, with interests that can be used to create relevant and powerful learning opportunities. Their words are perhaps even more pertinent today than when they wrote them in 2008:

We believe that most attempts by schools to increase relevance fail because they are not thinking deeply about what constitutes authentic relevance. Three core requirements for relevance are particularly overlooked. The first is that relevance is in the eye—and mind—of the student, not the teacher.

Second, relevance redefines the student–teacher relationship, requiring the teacher to establish a relationship with the student through his interests. Finally, relevance requires a balanced attention to students' interests and the curriculum.

(Washor & Mojkowski, 2008)

It is my sincere hope that the innovations outlined address all three of the above priorities.

Two more issues: The overcrowded curriculum and the state of educational leadership

Despite the innovations outlined above, serious challenges to our quest to shift the educational paradigm remain. As I approach the end of this book, I would like to point to two issues facing all schools trying to transform themselves—*our overcrowded curriculum* and *the prevailing nature of educational leadership*—the latter strongly influenced by the actions of State and Federal Governments. Our overcrowded curriculum impacts heavily on teachers, resulting in most finding themselves 'time-poor', particularly when we combine curriculum needs with the additional accountability and data processing requirements discussed earlier. This is a situation which often results in teachers addressing their accountability tasks first and students' needs second!

Unfortunately, our overcrowded and outdated curricula is far more insidious for schools wishing to innovate. Not long ago, I organised a two-day conference for my staff and asked six of my Year 6 students to tell staff what they liked and did not like about our school. Staff were particularly interested in the Enigma Missions that one boy had undertaken. In Year 5, he had chosen to research Black Holes and had become particularly interested

in the work of Albert Einstein. When asked what he wanted to study at the start of Year 6, he replied 'Einstein's General Theory of Relativity'. His mentors for these projects were scientists from NASA.

The boy in question was subsequently asked by one of the teachers how much time had he spent on his Enigma Mission at school and at home. To my disappointment, he said he spent around 95 percent of his time researching the topic at home. I immediately realised we had a serious problem. The innovations we had introduced had simply been added to an already overcrowded curriculum, with little or no thought given to what we could delete from the curriculum in order to meet this student's needs. While, subsequently, we have emphasised the importance of students negotiating their learning with teachers, the problem is far from resolved. By forcing students to pursue such learning at home, teachers, unwittingly, are maintaining the status quo and undermining the school's commitment to student agency.

This is not surprising given the dearth of educational discussion about this issue and the emphasis governments and parents place on our outdated, level-based curricula. Two educators who have seriously addressed this issue are **David Perkins**, from Project Zero and **Valerie Hannon**, from the UK Innovation Unit. Both have written thought provoking books on the subject—Perkins' *Future Wise* (2014) and Hannon's *Thrive* (2016).

A recent paper written by **Andreas Schleicher** for the Centre for Strategic Education (2018) highlights the finding—based on OECD surveying—that three out of four teachers in the industrialised world consider their workplace 'an environment that is essentially hostile to innovation'. In it, Schleicher attributes this situation to conservative leadership:

[T]he real obstacle to educational reform is not conservative followers but conservative leaders: leaders who exploit populism to preserve the status quo; leaders who stick to today's curriculum rather than adapt pedagogical practice to a changing world, because it is so much easier to stay within everybody's comfort zone; leaders who invest in popular solutions …

(Schleicher, 2018)

While I agree with Schleicher that there are many principals and educational leaders who are unwilling to recognise the need for a paradigm shift in our system of schooling, there are many leaders who fight a daily battle to overcome departmental and Government directives aimed at preserving the status quo. Consider the following comments from highly respected educators. **Nelson Gonzalez**, co-founder and Chief Strategic Officer of the personal learning technology company Declara, writes:

While we have many 'beautiful exceptions' around the world of what great learning looks like, we have not been able to move these to sustainable scale, in a way that ensures equitable access.

At the invisible epicentre of this drama there exists a fascinating breed of leaders who embody this current predicament—cohorts of teachers, school leaders, administrators, policy

makers, and community activists who understand that they must, every day, carry out two contradictory tasks:

1. Responsibly implement the mandates of the current system for the sake of the young people still in it (and for necessary self-preservation); while
2. Subversively designing components of new systems more attuned to the needs of these same young people.

These leaders understand that they must act, simultaneously, as hospice workers to dying structures whose utility has largely passed, and as midwives to emerging systems whose form is not fully defined.

(Gonzalez, 2014)

David Price, who I introduced earlier, paints a similar, but perhaps bleaker picture of the bind in which school leaders find themselves:

The recent history of education policy in western developed countries —with the possible exception of Finland—could be summarised as short-termist and output driven. Command and control (and few sectors of public life are subject to as much command and control as education) deprives school leaders of the ownership of

their destiny and how they will be judged. *They live or die by their students' performance in standardised tests, not their long-term ability to be adaptive, life-long, employable learners.*

(Price, 2015. My emphasis.)

It is not as if progressive educators have been silent on the need for changes to our system of education. **Pasi Sahlberg** asserts that in their pursuit of results, Australian politicians have placed too much emphasis on competition between schools and students, making education too 'high stakes' (Sahlberg cited in McGowan, 2018). Tom Bentley agrees:

[A]t every level, Australian schooling is subject to a competitive dynamic, which disfigures the moral purpose of educational endeavour and distorts the choices and behaviour of students, teachers, school leaders, education policy makers and interest groups.

(Bentley, 2018)

Numerous reports have been written on the subject of improving our schooling practices. Microsoft and McKinsey & Company for instance, affirm in 'The class of 2030 and life-ready learning: The technology imperative' that:

A dominant theme of our findings is a need for greater student centricity and a heightened focus on learners. The students we surveyed

In the same report, it is asserted that given our current education systems less than 50 percent of students will be prepared for the fastest growing jobs of the future. It stresses the need for students to develop their social emotional skills—often referred to as soft skills—if they are to be employable in the future. Despite reports such as this, the Australian Minister for Education, the Hon. Dan Tehan, recently flagged a revamp of the national curriculum, saying we need to get 'back to basics' like reading, writing and maths, before worrying about 'soft skills' like teamwork and critical thinking (ABC News, 2018). Such a statement would be laughable, if it were not for the ramifications of implementing such a policy. Soft skills are the basic skills of tomorrow and the earlier we introduce them to students the easier they will be to learn. Resume Genius, a resume building website, lists the following as the 'top ten skills employers love':

- Communication
- Teamwork
- Problem solving
- Creativity
- Adaptability
- Work ethic
- Interpersonal skills
- Time management
- Leadership
- Attention to detail

(Resume Genius, n.d.)

Why is it that our politicians have such a fascination with the so called basics, instead of exploring the advantages of what Price refers to as 'open' or 'informal' learning? 'Back to the basics' has been the catch-cry of politicians, conservative teachers and parents unhappy with the standard of learning in our schools for all of my career as an educator. However, I can honestly say I have never experienced a 'golden age' of learning that I wanted to recreate! As a young teacher it was the 3Rs—reading, writing and arithmetic. Today it is numeracy and literacy, as highlighted by NAPLAN. I do not question the need for our students to be numerate and literate. But I want much more for my students. I want them to live enjoyable, fulfilling lives when they leave school, and to do that, they will need to be more than literate and numerate.

The web is full of lists of twenty-first-century skills that today's students will need in order to live fulfilling lives in a world dominated by information and change. Applied Educational Systems lists the following 12 essential skills: critical thinking; creativity; collaboration; communication; information literacy; media literacy; technology literacy; flexibility; leadership; initiative; productivity and social skills. The writers of this list believe that these skills are essential in the age of the internet.

I am not suggesting that the above list of skills, or similar ones, become our new basics. My purpose in listing these skills is to highlight the absurdity of focusing so much of our attention on a few historically important skills. This practice has narrowed the school curriculum, helped resist much needed innovation and ushered into our schools accountability practices that undermine our school principals' and teachers' roles as professional educators.

The following two paragraphs from Price may help further clarify the situation progressive educators find themselves in today:

Instead of a forward focused public discussion on the challenges of the labour

market, or the opportunities presented by informal learning, what we have seen and heard from politicians and policy makers tends to be a nostalgic desire to return to the certainty of the 'basics'. Such nostalgia is bolstered by the PISA performance of countries favouring traditional pedagogies *(whilst neatly avoiding the inefficiency of learning systems that, in order to be successful, require students to work longer hours than 19th century English child factory hands).*

While this myopic and somewhat irrelevant argument takes place, the gulf in motivation between the learning that our students have to do, and the learning that they choose to do, grows ever wider. Meanwhile, the implementation of standardised testing and high-stakes accountability leaves a devastating legacy of 'side effects' *(Zhao, 2012)*: increasing student (and staff) disengagement; perceived irrelevance of formal education; and the loss of autonomy and trust in the teaching profession.

(Price, 2015)

Additional Links

WPPS's multidisciplinary approach is practised in the imaginative way its curriculum follows mandate programmes.

Read the interview of Year 5/6 teacher Kim Campbell and her presentation of WPPS teaching of citizenship in Thailand at schoolstoryexperience.com/making-international-connections

Enjoy a 'class parliament' adventure of teaching citizenship to Year 2s by the teaching team of Mary Boutros, Sapna Vats and Zana Hunt at schoolstoryexperience.com/year-2-class-parliament

Mathematics—Read teacher Melissa Brighton's inspiring interview of how Year 1 students applied mathematical concepts in organising a fundraising Trivia Night at schoolstoryexperience.com/letting-children-lead-the-learning

Writing—Read school librarian Debra Nugent's foundational work through the school library in multi-year programmes in which students publish their creative stories at schoolstoryexperience.com/the-da-vinci-centre-story

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I would like to conclude with the thoughts of one of my students, followed by some remarks about the increasing role of parents in the transformation of our schools. I do this because as I read back over the book, I realise that I have not captured the voices of my students, or their parents. Rather, I have left the case studies and videos to highlight their involvement. However, nothing could be clearer to me, that it is students and their parents, in the final analysis, that decide our success or failure as educators. When asked to write a short statement about how her learning was progressing, the student, Kohuroa, responded:
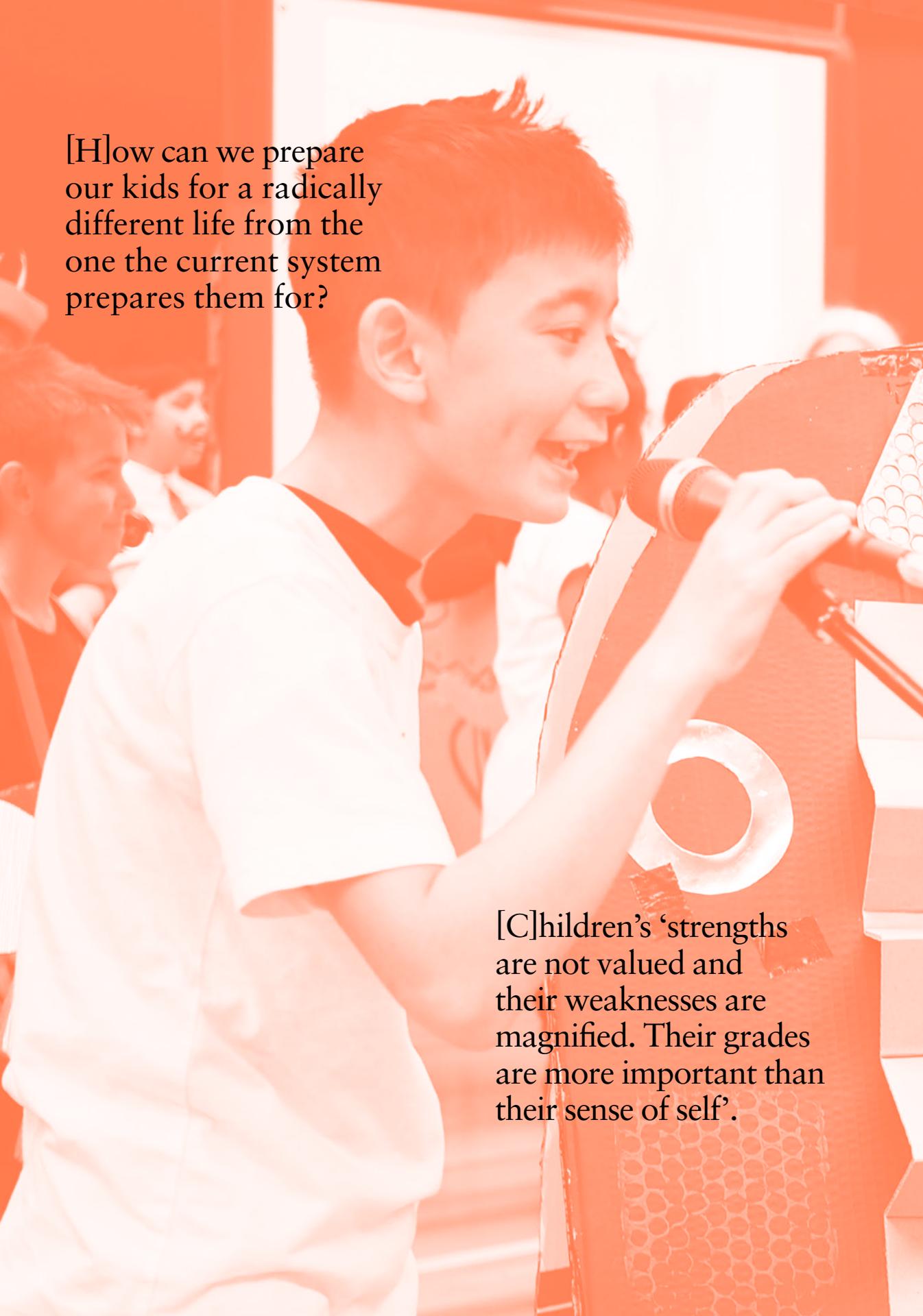
So far, this year has been so different from last year. It feels like the world has just changed itself, just like that!

I believe that the whole idea of Wooranna Park Primary School is to lift us and our capabilities. The way the staff treat us is as if we're adults and not students. Wooranna Park is to make us feel complete, like we have finally achieved something as students. To tell us that all our sins are in the past, like they were never even there.

I have felt dark days, like a shadow has been cast upon me, but Wooranna has helped me to overcome that and that's what makes me, me. Wooranna is my home. The teachers are our role models, leaders. All of us are connected in some possibility.

I have done a lot this year. Enigmas for example. This is to help us with our knowledge, passion, education, leadership and our roles in life. I believe that we all have a voice and Wooranna is our guide.

(Kohuroa Haddon, Year 6 student)

[H]ow can we prepare
our kids for a radically
different life from the
one the current system
prepares them for?

[C]hildren's 'strengths
are not valued and
their weaknesses are
magnified. Their grades
are more important than
their sense of self'.

[O]ne-size-fits-all approach, orchestrated by individuals that have no business dictating educational policy, is producing students who have no ability to think for themselves and [have] an absolute fear of failure.

[W]ill my children discover their potential and be guided to a career that they love and are passionate about?

Concluding remarks

It is my privilege to have worked alongside many talented teachers during my time at Wooranna Park Primary School. If we have achieved anything at the school in the past twenty-two years it is because parents have trusted us to challenge the status quo. Today over 39 percent of our students live outside the school's postcode area. Many of the students travel a considerable distance to attend WPPS. They do so because their parents want them to have an education that both excites and prepares them to live fulfilling lives as adults. Our students and their parents are part of a growing cohort from around the world that want more from their schools. **Sir Ken Robinson**, in his 2018 book co-written with **Lou Aronica**, *Your Child and School, Navigate Your Way to the Best Education*, describes how he approached parents on Twitter and Facebook, asking them to tell him their concerns about their children's education. In less than an hour, hundreds of people from around the world answered his request. The sample of replies included in his book are consistent with the general tenor of this book.

Bec replied that her children's 'strengths are not valued and their weaknesses are magnified. Their grades are more important than their sense of self'.

Kimmi asked, 'Will my children discover their potential and be guided to a career that they love and are passionate about?'

Conchita asserted, 'I have all sorts of worries about my daughters. I feel the current system will not let them shine and my ten-year-old may not get what she needs to overcome her learning disabilities'.

Jon was concerned that children 'are gradually being taught not to enjoy learning; that it's somehow an arduous rite of passage we're all forced to go through with no sound reasoning. It's a constant battle to keep that spark of curiosity and delight about learning alive when the system packages it and sets narratives about education the way it does'.

Karin affirmed that, 'Education is broken. There's too much pressure, too many tests, too many demands, too much assembly line. How can we reboot? How can we prepare our kids for a radically different life from the one the current system prepares them for?'

Carol worried that the 'one-size-fits-all approach, orchestrated by individuals that have no business dictating educational policy,

is producing students who have no ability to think for themselves and [have] an absolute fear of failure'.

Another responder expressed concern as to whether schools 'are teaching kids to be creative problem solvers. Testing doesn't teach kids to be versatile thinkers'.

Tracey, meanwhile, voices a worry shared by many parents. 'I'm most concerned with the fact that policy makers seem to have little regard for parent voices. The culture around parent voices is dismissive at best and those who make decisions about kids haven't a clue what actually goes on in classrooms'.

I suspect that many of our students' parents would express similar concerns about education in general. I know that they are worried that their children's secondary schooling may not include many of the values and educational practices outlined in this book. In response to these fears, they are exploring the possibility of establishing WPPS as a Foundation to Year 9 school. Logic says that the Victorian Government would be unlikely to finance such an undertaking, given the number of secondary schools in the area. This has not stopped a group of our parents and teachers canvassing support for such a project, despite the long list of obstacles they would have to overcome. Unfortunately, I can only admire their courage and tenacity, and wish them the best of luck in their quest.

I have decided to conclude with a quotation from **Will Richardson**, whom I introduced earlier. In reviewing the current political climate in the US, Richardson laments the inadequacy of today's education for preparing students to be 'community' and 'country' ready to address the challenges facing them. This poses a question for all of us involved in education:

Additional Links

Barbara Hopcraft has worked as a teacher's aide, in the school administration and has sent all her four children to the school. She has also worked in the role of President of the School Council. Read her interview at schoolstoryexperience. com/the-long-term-view

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Is there any question that we have sacrificed many of the life literacies that we all could certainly use right now in our worship for standardisation, ranking, data and those things that are easy to measure? The ability to feel empathy for others, to discuss difficult topics with those who disagree with us in ways that don't end up in a viral video, to 'cope with' change and, importantly, to adapt to new realities of every shape and scale. We'd rather teach the safe stuff, the state bird, multiplication tables, the Battle of Antietam, and Shakespeare, in the safe way, where none of it gets commingled and messy and iterative. The black and white version of schooling that predominates now leads our students to an 'education' yet leaves them 'undereducated,' illiterate in modern contexts, and deeply resistant to complexity.

And so the question remains, only with even more urgency as chaos reigns. Will we change? Can we?'

(Richardson, 2017b)

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Grey
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Videos

The following videos were created between 2012 and 2014 to explain to our school community how we personalise children's learning at Wooranna Park Primary School.

Personalising Student Learning: An Introduction
t.ly/Rfkf
....

Authentic Learning
t.ly/Rfkf
....

Autonomous Learners Program
t.ly/KShs
....

Collaborative Learning
t.ly/RGrg
....

Differentiating the Curriculum
t.ly/ta0o
....

Documenting Learning
t.ly/xC3m
....

Learning Agreement Time
t.ly/5FO9
....

Professional Development
t.ly/xzJh
....

Student Conferencing
t.ly/UfZ5
....

Student Learning Plans
t.ly/8nD6
....

Student Led Reporting
t.ly/njU7
....

Student Voice
t.ly/B7FA
....

Target Teaching
t.ly/UfZ5
....

Appendix

artofproof.com
This AR art project at Wooranna Park Primary School is the first of its kind. We are utilising eyejack AR software to create unique student centric art pieces throughout the school that will come together as a flowing narrative. Each art piece will have its own hash or 'proof' embedded in the artwork and listed on a DEX.

Cisco
Our school runs probably the youngest Cisco Networking Academy in the world, where we enable students to build and creating their own physical and virtual networks. The Cisco Networking Academy Program is a comprehensive e-learning program that provides students with the Internet technology skills essential in a global economy. The Networking Academy delivers web-based content, online assessment, student performance tracking, hands-on labs, instructor training and support, and preparation for industry standard certifications.

Decentralschools.com
An open index of web3 tools for schools to upgrade their learning environments.

eSports
We have been using gamification and games in education for a number of years, only more recently starting to formalise these activities into an eSports Academy. eSports is a form of sport competition using video games. eSports often takes the form of organized, multiplayer video game competitions, particularly between professional players, individually or as teams.

Full nodes

We have built and are currently running authentication nodes for numerous blockchains in the interests of the community and education. A full node is a program that fully validates transactions and blocks. Almost all full nodes also help the network by accepting transactions and blocks from other full nodes, validating those transactions and blocks, and then relaying them to further full nodes.

Interplanetary File System (IPFS)

IPFS is a protocol and network designed to create a content-addressable, peer-to-peer method of storing and sharing hypermedia in a distributed file system. IPFS was initially designed by Juan Benet, and is now an open-source project developed with help from the community. We are implementing a platform that will empower WPPS students to have true agency over their work. The platform, called Rocketshoes, will be integrated with the blockchain.

LBRY

LBRY is a blockchain based permanent YouTube alternative. LBRY is an internet protocol (like HTTP or SMTP) that allows the publishing of digital content with no middlemen and no interference. After interviewing the CEO of the company, students at Wooranna have created their own student driven project to explore the protocol. *Lbryproject.github.io*

Ledger

Students have been experimenting with authentication and Ledger hardware. A Ledger is a hardware wallet based on robust security features for storing cryptographic assets and securing digital payments. It connects to any computer via USB and includes an encrypted OLED display output to double check and confirm each transaction with a single tap on its side buttons.

Minecraft

We have developed a white hat hacking class using Minecraft as a digital learning environment. Incorporating blockchain hardware and software, students learn about secure hashing using 24-word passphrases. In Minecraft, players explore a blocky, procedurally-generated 3D world with infinite terrain, and may discover and extract raw materials, craft tools and items, and build structures or earthworks. Depending on game mode, players can fight computer-controlled 'mobs', as well as cooperate with or compete against other players in the same world. Game modes include a survival mode, in which players must acquire resources to build the world and maintain health, and a creative mode, where players have unlimited resources. Players can modify the game to create new gameplay mechanics, items, and assets.

Virtual Learning Space—Mozilla HUBS

We are building an international, student-centric virtual school with students and staff from all over the world in conjunction with Immersive Education USA. Hubs by Mozilla let people meet in and shared 360° environment, using just their browser. Hubs works on any device, from head-mounted displays like HTC Vive to 2D devices like laptops and mobile phones. Using WebVR, a JavaScript API, Mozilla is making virtual interactions with avatars accessible via Firefox and other browsers that people use every day.

Endnotes

1. 'Best practice' is used here to describe pedagogy generally regarded by the teaching profession as worthy of adoption. 'Next practice' refers to the introduction of innovative practices designed to reinvent the teaching profession in order to address the future needs of students.

2. At the time, the Australian Government was proposing to extend NAPLAN to include the testing of Year 2 and Year 8 students.

3. See *Pygmalion in the Classroom* by Robert Rosenthal and Lenore Jacobson, 1965. The Pygmalion or Rosenthal effect is the phenomenon whereby higher expectations lead to an increase in performance.

4. The holodeck is a fictional plot device from the television series Star Trek. It is a staging environment in which participants may engage with different virtual reality environments.

5. Microsoft describes 'holoportation' as 'a new type of capture technology that allows high-quality 3D models of people to be reconstructed, compressed and transmitted anywhere in the world in real time. When combined with mixed reality displays such as HoloLens, this technology allows the user to see, hear and interact with remote participants' (Microsoft, n.d.).

6. Professor George Betts of North Colorado University introduced these tenets to the school in 1998.

References

ABC News (2018) 'Education Minister flags plan to simplify "cluttered" national curriculum and "get back to basics"', ABC News Breakfast, 10 December 2018. Accessed 1 April 2019, at www.abc.net.au/news/2018-12-10/education-minister-dan-tehan-flags-revamp-of-national-curriculum/10600064

Applied Educational Systems (n.d.) 'What are 21st century skills', Applied Educational Systems, www.aeseducation.com/career-readiness/what-are-21st-century-skills

Ashenden, D (2018) *Australia's School Reform Strategy Has Failed. What Now?* CSE Seminar Series Paper 273, Centre for Strategic Education, Melbourne, May.

Australian Institute for Teaching and School Leadership (AITSL) (2014) 'Learning frontiers: Professional practices to increase student engagement in learning. Issue 2: Insights and ideas'. Accessed 20 March 2019 at http://ais.act.edu.au/wp-content/uploads/2016/03/insights-and-ideas-issue-2.pdf

Bentley, T (2018) *Australian Schooling in the Next Decade: More than the Sum.* CSE Seminar Series Paper 280, Centre for Strategic Education, Melbourne, November.

Bentley, T and Savage, G C (2017) 'Educating Australia— Why our schools aren't improving', *The Conversation*, 2 February 2017. Accessed 20 March 2019, at https://theconversation.com/educating-australia-why-our-schools-arent-improving-72092

Bergeron, P-J and Rivard, L (2017) 'How to engage in pseudoscience with real data: A criticism of John Hattie's argument in *Visible Learning* from the perspective of a statistician', *McGill Journal of Education*, 52, 1. Accessed 20 March 2019, at http://mje.mcgill.ca/article/view/9475/7229

Berry, J (2014) 'How did we get into this state?' Accessed …, at https://www.yumpu.com/en/document/read/47406615/reclaimingschools-essays-9963

Boaler, J (2015) 'Fluency without fear: Research evidence on the best ways to learn math facts', Youcubed, Stanford University. Accessed 19 March 2019, at www.youcubed.org/evidence/fluency-without-fear

Bruce, B and Sahlberg, P (2016) 'Bryan Bruce interviews Dr Pasi Sahlberg', interview recorded for inclusion in 'World class? A documentary about the New Zealand education system'. Accessed 19 March 2018, at www.youtube.com/watch?v=1w7CunvjvdE

Chung, F (2015) 'Australia's freelance economy grows to 4.1 million workers, study finds', news.com.au, 27 October 2015. Accessed 19 March 2019, at www.news.com.au/finance/work/at-work/australias-freelance-economy-grows-to-41-million-workers-study-finds/news-story/629dedfaea13340797c68822f4f2a469

Cook, H (2016) 'The downside of separating students into A, B and C classes', *The Age*, 13 March 2016. Accessed 19 March 2019, at www.theage.com.au/national/victoria/the-downside-of-separating-students-into-a-b-and-c-classes-20160313-gnht1x.html

Cormick, W (2017) 'President's message', *Principal Matters*, 32.

Duncan, A (2018) *How Schools Work*, Simon & Schuster, New York.

Evidence For Learning, "Setting or Streaming". Accessed 26 April, at https://evidenceforlearning.org.au/toolkit/setting-or-streaming/

Foundation for Young Australians (FYA) (2015) 'Report card 2015: How are young people faring in the transition from school to work?' Accessed 19 March 2019, at www.fya.org.au/wp-content/uploads/2015/11/How-young-people-are-faring-report-card-2015-FINAL.pdf

Foundation for Young Australians (FYA) (2017) 'The new work smarts: Thriving in the new work order' Accessed 1 April 2019, at www.fya.org.au/wp-content/uploads/2017/07/FYA_TheNewWorkSmarts_July2017.pdf

Foundation for Young Australians (FYA) (2018) 'The New Work Reality' Accessed 26 April 2019, at www.fya.org.au/wp-content/uploads/2018/06/FYA_TheNewWorkReality_sml.pdf

Frey, C B and Osborne, M A (2013) 'The future of employment: How susceptible are jobs to computerisation?' Oxford University, 17 September 2013. Accessed 19 March 2019, at www.oxfordmartin.ox.ac.uk/downloads/academic/The_Future_of_Employment.pdf

Geurin, D C (2017) *Future Driven: Will Your Students Thrive in an Unpredictable World?* David Geurin (self-published e- and audiobook).

Godin, S (2016) *Stop Stealing Dreams (What is School for?)* Accessed 20 March 2019 at www.pdfdrive.com/stop-stealing-dreams-seth-godin-e27055.html

Gonzalez, N R (2014) *Educators as Designers: New Systems to Scale Deep Learning*. CSE Seminar Series Paper 236, Centre for Strategic Education, Melbourne, July.

Gorur, R and Lewis, S (2017) 'NAPLAN has done little to improve student outcomes', *The Conversation*, 17 November 2017. Accessed 19 March 2019 at https://theconversation.com/naplan-has-done-little-to-improve-student-outcomes-86049

Hagel, J (2017) 'Never under-estimate the immune system', *Edge Perspectives with John Hagel*, 7 December 2017. Accessed 19 March 2019 at https://edgeperspectives.typepad.com/edge_perspectives/2017/12/never-under-estimate-the-immune-system.html

Hannon, V (2017) *Thrive*. Innovation Unit Press, London.

Hirsch, E D (2016) *Why Knowledge Matters: Rescuing Our Children from Failed Educational Theories*. Harvard Education Press, Cambridge, MA.

Jelita, A (2017) 'The downsides to Singapore's education system: Streaming, stress and suicide', *South China Morning Post*, 21 September 2017. Accessed 19 March 2019 at www.scmp.com/lifestyle/families/article/2111822/downsides-singapores-education-system-streaming-stress-and

King, R (2016) *Singapore's Education System, Myth and Reality: A Reputation Deserved or Fabricated?* CreateSpace Independent Publishing Platform, Scotts Valley, CA.

Langer, J (2016) 'Students as teachers', Usable Knowledge, *Harvard Graduate School of Education*, 20 December 2016. Accessed 19 March 2019 at www.gse.harvard.edu/uk/blog/students-teachers

Leadbeater, C (2017) *Student Agency: Learning to Make a Difference*, CSE Seminar Series Paper 269, Centre for Strategic Education, Melbourne, December.

Masters, G N (2016) 'Five challenges in Australian school education', *Policy Insights*, 5, ACER, Camberwell, Vic.

Masters, G N (2017) 'Shifting the focus of NAPLAN', *Teacher Bulletin*, 11 September 2017, ACER, Camberwell, Vic.

McGowan, M (2018) 'Too much control: Pasi Sahlberg on what Finland can teach Australian schools', *The Guardian*, 7 January 2018. Accessed 20 March 2019 at www.theguardian.com/australia-news/2018/jan/07/pasi-sahlberg-finland-teach-australian-schools-education

McPherson, S (2017) 'Gen Z: World wise, digital natives, changemakers', Foundation for Young Australians, 6 October 2017. Accessed 20 March 2019 at www.fya.org.au/2017/09/28/gen-z-world-wise-digital-natives-changemakers

Microsoft (n.d.) 'Holoportation'. Accessed 1 April 2019, at www.microsoft.com/en-us/research/project/holoportation-3

Microsoft and McKinsey & Company (2018) 'The class of 2030 and life-ready learning: The technology imperative'. Accessed 1 April 2019, at https://education.minecraft.net/wp-content/uploads/13679_EDU_Thought_Leadership_Summary_revisions_5.10.18.pdf

Moore, D (2017) 'The Cult of John Hattie: "Wilful blindness"?' Darcy Moore.net, 26 August 2017. Accessed 20 March 2019 at www.darcymoore.net/2017/08/26/cult-hattie-wilful-blindness

Perkins, D N (2014) *Future Wise: Educating Our Children for a Changing World*. Jossey-Bass, San Francisco, CA.

Price, D (2013) *OPEN: How We'll Work, Live and Learn in the Future*. Crux Publishing, UK.

Price, D (2015) *Open Learning Systems: Unlocking Innovation*. CSE Seminar Series Paper 242, Centre for Strategic Education. Melbourne, February.

Puttnam, D (n.d.) Voice recording, included in 'Personalised student learning' video, Wooranna Park Primary School, www.woorannaparkps.vic.gov.au

Renaissance.com (n.d.) 'What is student agency?'. Accessed 1 April 2019, at www.renaissance.com/edwords/student-agency

Richardson, W (2015) 'The surprising truth about learning in schools', TED Talk, 21 November 2015. Accessed 20 March 2019 at www.youtube.com/watch?v=sxyKNMrhEvY

Richardson, W (2017a) 'The 21st century's missing "C" word', Email correspondence.

Richardson, W (2017b) 'Schools in a time of chaos: How do we make sense of a nonsensical world?', *The Modern Learners Reader*, 1, p 22–26. Accessed 29 March 2019 at https://s3-us-west-2.amazonaws.com/modernlearners/The+Modern+Learners+Reader%2C+Vol.+1.pdf

Richardson, W (2017c) 'The changing nature of knowledge: Rethinking content's role in the classroom', *The Modern Learners Reader*, 1, p 30–32. Accessed 29 March 2019 at https://s3-us-west-2.amazonaws.com/modernlearners/The+Modern+Learners+Reader%2C+Vol.+1.pdf

Robinson, K (2016) 'Big picture: Big bang', Keynote speech, Orlando, FL, 11 August 2016. Accessed 29 March 2019 at www.youtube.com/watch?v=9xCGAVQOUB4

Robinson, K and Aronica, L (2018) *You, Your Child and School: Navigate Your Way to the Best Education*. Penguin Putnam, New York.

Rosenberg, M (2017) 'Marc My Words: The coming knowledge tsunami', *Learning Solutions*, 10 October 2017. Accessed 20 March 2019 at www.learningsolutionsmag.com/articles/2468/marc-my-words-the-coming-knowledge-tsunami

Sahlberg, P (2012) 'GERM that kills schools', TEDXEast Talk, 27 June 2012. Accessed 20 March 2019 at www.youtube.com/watch?v=TdgS--9Zg_0.

Sahlberg, P (2012) 'How GERM is infecting schools around the world', *The Washington Post*, 29 June. Accessed on 26 April 2019 www.washingtonpost.com/blogs/answer-sheet/post/how-germ-is-infecting-schools-around-the-world/2012/06/29/gJQAVELZAW_blog.html

Sahlberg, P (2012), PASISALHBERG.COM blog, https://pasisahlberg.com/text-test/

Sahlberg, P and Hasak, J (2016) 'Next big thing in education: Small data', The *Washington Post*, 9 May 2016. Accessed 20 March 2019 at https://pasisahlberg.com/next-big-thing-education-small-data

Schilling, D R (2013) 'Knowledge doubling every 12 months, soon to be every 12 hours', *Industry Tap into News*, 19 April 2013. Accessed 20 March 2019 at www.industrytap.com/knowledge-doubling-every-12-months-soon-to-be-every-12-hours/3950

Schleicher, A (2018) *Building a High-performing 21st Century School System*. CSE Seminar Series Paper 278, Centre for Strategic Education, Melbourne, August.

Staley, O (2016) 'To predict a student's future success, look at their grades, not their IQ or SAT score', *Quartz*, 6 December 2016. Accessed 20 March 2019 at https://qz.com/853128/grades-not-iq-or-standardized-test-score-is-what-predicts-future-success

Sheninger, E and Murray, T C (2017) 'Eight keys for transformative school design', *ASCD Express*, 12, 22. Accessed 20 March 2019 at www.ascd.org/ascd-express/vol12/1222-sheninger.aspx

Sterbenz, C (2015) 'Here's who comes after Generation Z—and they'll be the most transformative age group ever', *Business Insider*, 5 December 2015. Accessed 20 March 2019 at www.businessinsider.com/generation-alpha-2014-7-2

Thornburg, D D (2013) *From the Campfire to the Holodeck: Creating Engaging and Powerful 21st Century Learning Environments*. Jossey-Bass, San Francisco, CA.

Torak, S and Holper, P (2016) *Imagining the Future: Invisibility, Immortality and 40 Other Incredible Ideas*. CSIRO Publishing, Clayton, Vic.

Torii, K (2018) 'Connecting the worlds of learning and work: Prioritising school–industry partnerships in Australia's education system', Mitchell Institute Report No.02/2018, Melbourne.

Wang, T (2017) 'The human insights missing from big data', TEDxCambridge Talk, 13 December 2017. Accessed 20 March 2019 at www.ted.com/talks/tricia_wang_the_human_insights_missing_from_big_data/transcript?language=en

Washor, E and Mojkowski, C (2008) 'Perspectives on relevance and the quest for rigorous student learning: Balancing life to text and text to life', *Curriculum & Leadership Journal*, 6, 8. Accessed 20 March 2019 at www.curriculum.edu.au/leader/leader/perspectives_on_relevance_and_the_quest_for_rigoro,22205.html

Wooranna Park Primary School (n.d.) 'Personalising student learning: 13 videos'. Accessed 20 March 2019 at www.woorannaparkps.vic.edu.au

Zhao, Y (2012) *World Class Learners: Educating Creative and Entrepreneurial Students*. Corwin, Thousand Oaks, CA.

Zhao, Y (2016a) 'Educating for first world economies,' Keynote speech, 28 May 2016, AISSA Governance Conference. Accessed 20 March 2019, at www.youtube.com/watch?v=EMzLc_T36Uc

Zhao, Y (2016b) 'From deficiency to strength: Shifting the mindset about education inequality', *Journal of Social Issues*, 72, 4, p 716–735. Accessed 20 March 2019 at http://zhaolearning.com/wp-content/uploads/2016/10/josi12191_LR.pdf.

Zhao, Y (2018) *Reach for Greatness: Personalizable Education for All Children*. Corwin, Thousand Oaks, CA.

[A]nd so the question remains, only with even more urgency as chaos reigns. Will we change? Can we?

Will Richardson

WOORANNA PARK PRIMARY SCHOOL

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As Principal of Wooranna Park Primary School (WPPS) since 1987, I have had three of my six grandchildren attend my school. Seeing your school through the eyes of a child that you love can be an interesting experience, full of wonderful and sobering interludes. Being told one Sunday morning that my prep grade grandson was crying because he couldn't go to school is very much a highlight, but this needs to be balanced by my inability to answer many of the *'Why can't we?'* questions asked of me. Looking through my grandchildren's eyes has fuelled my desire to create a school where curiosity and excitement pervade children's learning.

Ray Trotter
Principal—Wooranna Park Primary School

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