NEW ZEALAND'S

EDUCATION DELUSION

How bad ideas ruined a once world-leading school system

Briar Lipson
Foreword by Michael Johnston

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About the New Zealand Initiative

The New Zealand Initiative is an independent public policy think tank supported by chief executives of major New Zealand businesses. We believe in evidence-based policy and are committed to developing policies that work for all New Zealanders.

Our mission is to help build a better, stronger New Zealand. We are taking the initiative to promote a prosperous, free and fair society with a competitive, open and dynamic economy. We are developing and contributing bold ideas that will have a profound, positive, long-term impact.

ABOUT THE AUTHOR

Briar Lipson is a Research Fellow specialising in education. Before joining The New Zealand Initiative, she was a mathematics teacher and Assistant Principal in London, where she was also involved with training teachers, creating curricula and opening Free Schools. Briar has worked for the international education trust CfBT and the Westminster think tank Policy Exchange. She holds a master's degree in Economics from the University of Edinburgh.

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Of course, responsibility for all views expressed, and any errors or omissions, lies with me.

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Foreword

I first met Briar Lipson in mid-2017 when she approached me to discuss the National Certificate of Educational Achievement (NCEA) and the New Zealand Curriculum (NZC). The stimulating dialogue that commenced with that discussion has continued ever since, enriching and challenging my thinking in equal measure.

In *New Zealand's Education Delusion*, Briar traverses questions that have featured in our many discussions: What should children learn at school and why? What general approaches to teaching are most effective? What does research from cognitive science tell us about constraints on learning and what are its implications for classroom practice?

Briar's exploration of these and other questions is more than timely – it is urgent. By many international metrics, the performance of New Zealand's schools has been declining for two decades, with the most disadvantaged of our young people being the most acutely affected. If we are to arrest this descent and the perpetuation of inter-generational poverty that comes with it, we must implement curricula based on knowledge and pedagogy supported by generalisable research evidence. As Briar argues, our curriculum is scant in its specification of knowledge and the pedagogical advice given to teachers is often *not* strongly founded in research evidence. Rather, the NZC is based on the unproven conjecture that generic skills and 'competencies' will displace more traditional disciplinary knowledge as the educational imperatives of the 21st century. The pedagogical advice offered by the Ministry of Education promotes broad and ill-defined notions of 'child-centred' learning and makes little reference to contributions that scientific research can make to pedagogy.

This wide ranging, articulately argued and – above all – *evidence-based* report throws down a gauntlet to the Ministry of Education and the New Zealand Council for Education Research (NZCER): Will the Ministry continue to champion a curriculum essentially devoid of content and knowledge, or will it have the courage to specify the knowledge that is the birth right of the children of Aotearoa – New Zealand? Will it continue to reify competencies as meaningful in and of themselves or will it recognise that competence only has substance in the context of knowledge, explicitly defined and deliberately taught? Will the NZCER continue to promulgate ill-defined concepts such as 21st century learning or will it turn towards providing reliable and generalisable research evidence to elucidate the methods of teaching that result in the most effective learning?

We have a hard problem to solve in New Zealand: How to transmit to our young people what British sociologist Michael F.D. Young calls the "powerful" knowledge of western disciplines, such as science, history and mathematics, as well as the more holistic and spiritually located understandings of mātauranga Māori. In approaching this problem, we must not treat mātauranga Māori as, at best, a footnote in the curriculum, as we have done so far. Neither must we fall prey to the increasingly fashionable but dangerously misguided notion that western disciplines are outmoded or – worse still – nothing but a legacy of colonial oppression.

We must establish a true partnership in which differences between western and Māori worldviews are understood and honoured, enabling their interaction so they can enrich one another. To do this well, we need curricula that elucidate the structure and content of the knowledge of each culture in enough detail to give teachers, who cannot themselves be experts on everything, sufficient guidance to impart that knowledge to young people.

We also need pedagogy to be informed by the most rigorous research evidence available and a teaching profession that is trained and supported to understand that research and to assimilate it into practice.

If we succeed in this, we will truly and quite literally "have the best of both worlds" and we will be able to turn around the shameful gap that has emerged between our educational 'haves' and 'have-nots,' with all too many young Māori and Pasifika people numbered among the latter. But we should not underestimate the difficulty of the task, nor the lost ground we have to make up. *New Zealand's Education Delusion* does not provide a silver bullet to break the links between educational underachievement, economic disadvantage and cultural disenfranchisement. It does however make an important contribution to a nascent educational reform movement that is committed to lifting us out of our current educational quagmire and setting us on a road to excellence with equity.

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Preface

Sometimes ideas are so pervasive, so foundational and taken for granted that they are almost entirely hidden from view. When I was a trainee and early-career teacher in England in the mid-2000s, I went along with ideas that I now know to be flawed or untrue. Central to them was child-centred philosophy.

An oft-used adage of the child-centred approach likens education to *the lighting of a fire not the filling of a pail*. When I was training to teach, few dared point out that we must first put something *inside* a pail before we could light it, that children need to have knowledge before they can learn independently.[1]

Instead, we were taught that creativity is conjured by great acts of spontaneity, which were only hampered by acquiring knowledge deliberately.

Because child-centred orthodoxy tells us that traditional teaching crushes individuality, motivation and agency, I was trained not to talk from the front of my classroom for more than a few minutes. I was trained to see group-work as preferable to silent practice, and activity as a sign that my students were learning. If children misbehaved in my classroom, it was because the content I was teaching lacked relevance. I must design lessons that engaged students and spoke to their interests.

My mentors told me "no significant learning occurs without a significant relationship." So I exhausted myself trying to get to know my 150 students (five classes of 30). My training left me desperate to avoid placing round-pegged children into square holes created by me.

And then, as I approached total burnout, I began visiting more successful schools. I explored beyond the 'recommended' reading list.

What I learned was that rather than being prepared for how to teach successfully, I had been indoctrinated in child-centred orthodoxy. I realised that many of my failures as a teacher and the failures of my students were actually the result of failed ideas.

Since then, I have worked in schools that repudiated child-centred orthodoxy. In these schools, my teaching capabilities and efforts remained unchanged. Yet my students made more progress and gained more confidence and motivation.

Upon moving to New Zealand I visited schools, read policy and research papers, and talked to teachers. It rapidly became clear to me that child-centred orthodoxy dominated official policy and discourse in this country.

For example, recently trained English teachers working in some of Auckland's lowest decile secondary schools told me how rather than selecting a text for their whole class to study, they were encouraged to let each child choose their own book. The rationale was that affording students this agency and respecting their choices about what was "relevant" would be motivating.

Of course, this approach rendered teaching the whole class impossible. Teachers could no longer read aloud to their class because each child was studying a different book. They could no longer ask the same pointed and pertinent questions that made their students think, or host class discussions that encouraged all students to participate. Even if teachers had super-human powers to read all the books and then plan and deliver multiple lessons, an hour's lesson would only afford each child two minutes of teacher input.

How low must expectations of students' motivation have fallen for the professionals who mentor new teachers to favour this child-led approach? How little value must they place on English teachers' years of degree-level study of literature to suggest they pick student choice over whole-class teaching?

Yet, when I challenged these young teachers about the wisdom of their mentors' advice, they expressed surprise. Just as I had done in England, many New Zealand educators adhere to child-centred educational philosophy entirely unknowingly.

As British educator Daisy Christodoulou explained in her groundbreaking book, *Seven Myths About Education*:[2]

> It is entirely possible to be influenced by the ideas of someone you have never heard of. Most of the OFSTED inspectors I have met present themselves as very practical and hard-headed people. Many of them may never have read or even heard of theorists such as Paulo Freire. But I would still contend that they are deeply influenced by such defunct theorists.[3]

This report seeks to expose New Zealand's most damaging and defunct educational ideas. It invites researchers, teachers and policymakers to question some ingrained assumptions. By presenting the evidence from the national curriculum, juxtaposed with that from research and cognitive science, it aims to challenge New Zealand's stifling consensus for child-centred orthodoxy.

Introduction

> *What does freedom mean and what are the conditions under which it is capable of realisation?*
> — John Dewey, *Experience and Education*[4]

The New Zealand education system is trying to fix a major learning gap. Some children grow up in households of lively learning, curiosity and encouragement. However, for historical and present-day reasons, many do not.

Take Tama. On the way to his first day of school, Tama excitedly talks to his parents about the neighbour's Pōhutukawa tree. He uses words like "crimson," "native" and "mythology." Tama's bouncing backseat chatter continues last night's dinnertime discussion about evergreens. Tama's house is full of books, educational toys and encouragement. Having long been addressed in full sentences, he has amassed a vast vocabulary. He has had a flying start to his educational career.

By contrast, the first day of school marks Lily's first real foray into the world of books and extended vocabulary. Books are scarce at home, and most of the language she hears comes from the TV. When they do talk to her, Lily's parents use simple words, short sentences and a limited vocabulary. For many reasons, adult investment in Lily's early education has been irregular and infrequent.

Children like Tama and Lily are so common they might as well be clichés.[5] Governments and charities across the world have recognised the vocabulary gap and set up programmes to teach parents the importance of talking and reading to children throughout their formative years.[6]

National curriculum policy can be powerful in tackling the vocabulary gap, too. Effective school systems encourage and support teachers to recognise and narrow disparities. Comprehensive, coherent and knowledge-based national curricula help ensure that no matter a child's starting point, they all finish school knowing what they need to succeed.

However, New Zealand's national curriculum (NZC) does not do this, because in place of knowledge, it is built on child-centred ideas.

In education, debates and dichotomies abound. Should teachers pass on knowledge, or should children discover it themselves? Is gaining knowledge the ultimate purpose, or is it developing skills? Should lessons break down and structure learning or resemble the final goal? Should adult authority be used to motivate pupils or is it a coercive and damaging tool?

For most teachers and parents, the answers lie somewhere in the middle. Absolutes are for radicals, and national education policies must offer flexibility and choice for parents and teachers. As Education Minister Chris Hipkins expressed it:[7]

> Education is a broad church. It's a wide spectrum with traditionalists at the one end and progressives at the other, all of whom believe their formula works best. The key to the changes we're making is to work hard to capture the best of each world view and bring the whole spectrum along.

Few would disagree with such a conciliatory statement. New Zealanders want peaceful, progressive solutions, not endless battles between extremes.

However, Hipkins' statement overlooks the extraordinary status quo in New Zealand.

Over the past 30 years, New Zealand's educational establishment – led by the Ministry of Education (MoE) and parts of the "research" community – has acceded to child-centred orthodoxy. With its clear preference for the latter option in all the dichotomies described above, child-centred idealism has controlled official discourse about schooling.

The philosopher Mary Midgley likened philosophy to plumbing.[8] For her, both systems are vital, and exist all but unnoticed in a complex culture. Yet, because of their complexity, when either system goes wrong it can be hard to know how to repair it. And the task is made harder in philosophy by people's scepticism about whether the system even exists. Philosophies, including educational philosophies, are more deeply hidden than plumbing. As Midgley explained: "When the concepts we are living by function badly, they do not usually drip audibly through the ceiling or swamp the kitchen floor. They just quietly distort and obstruct our thinking."[9]

It is this report's contention that uncritical adherence to child-centred philosophy is destroying standards and exacerbating inequity in New Zealand.

Data from international studies

Despite a 32% real rise in spending per pupil since 2001, all major international assessments of pupil performance – PISA, PIRLS and TIMMS – have charted New Zealand's decline to educational mediocrity.[10]

The OECD's Programme for International Student Achievement (PISA) measures how well 15-year-olds apply their knowledge and skills in reading, maths and science literacy in real-world contexts. In the year 2000, out of 32 countries, New Zealand's students proudly ranked 3rd in reading, 3rd in mathematics and

6th in science literacy. By 2018, amongst the same 32 countries, they had declined to the 6th, 19th and 6th places, respectively.[11]

This was a big drop considering that in reading and science, the average student's performance has fallen by the equivalent of about three terms worth of schooling.[12] The drop was even worse in mathematics, where students lost the equivalent of nearly a year and a half's worth of schooling.[13]

The Trends in International Mathematics and Science Study (TIMMS) assesses Year 5 and 9 students' maths and science attainment. The Progress in International Reading Literacy Study (PIRLS) assesses Year 5 students' reading attainment. As the five figures opposite show, TIMMS and PIRLS both find New Zealand lagging all its comparator English-speaking countries.

In maths, New Zealand students scored below the average of all participating countries. In reading, New Zealand ranked 24th out of all 26 participating OECD countries.[14] Behind nations like Spain and Slovenia, only France and Chile scored worse than New Zealand.

Despite this, looking only at data from the National Certificate of Educational Achievement (NCEA), you could be forgiven for thinking that New Zealand is doing better than ever. It is only by putting the national *and* international metrics together in one graph (see Figure 6) that the true story becomes clear. While the NCEA paints an illusion of rising standards, students' scores in the most basic areas have been dropping relentlessly.

Longitudinal TIMMS and PIRLS data for New Zealand and its comparator English-speaking countries

Australia England New Zealand United States Canada

Figure 1: TIMSS maths – Year 5

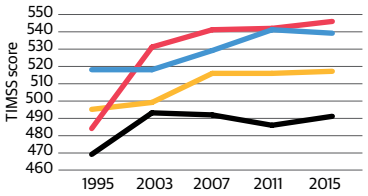


Figure 2: TIMSS maths – Year 9

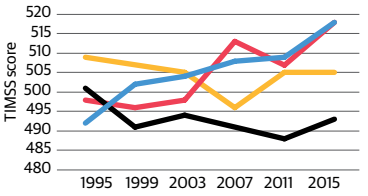


Figure 3: TIMSS science – Year 5

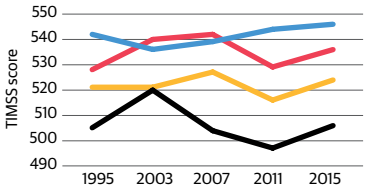


Figure 4: TIMSS science – Year 9

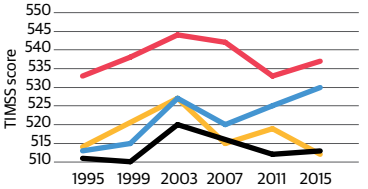
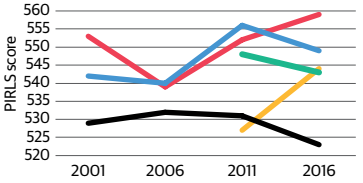
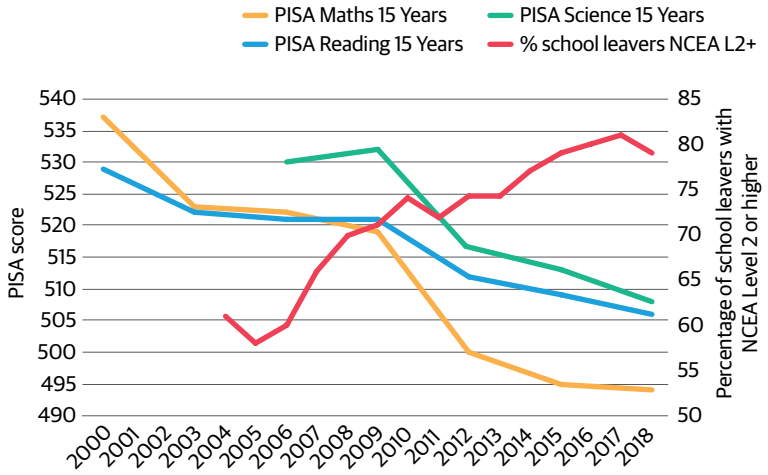


Figure 5: PIRLS – Year 5



Sources: Michael O. Martin, Ina V.S. Mullis, Pierre Foy, and Martin Hooper, "TIMMS 2015 International Results in Science" (Boston: International Association for the Evaluation of Educational Achievement, 2015), Exhibit 1.5; Michael O. Martin, Ina V.S. Mullis, Pierre Foy and Martin Hooper, "TIMMS 2015 International Results in Maths" (Boston: International Association for the Evaluation of Educational Achievement, 2015), Exhibit 1.5; Michael O. Martin, Ina V.S. Mullis, Pierre Foy and Martin Hooper, "PIRLS 2016 International Results in Reading" (Boston: International Association for the Evaluation of Educational Achievement, 2016), 25–29.

Figure 6: PISA and NCEA Level 2+ performance in New Zealand (2000–18)



	2000	2001	2002	2003	2004	2005	2006	2007	2008	2009	2010	2011	2012	2013	2014	2015	2016	2017	2018
PISA Maths 15 Years	537			523			522			519			500			495			494
PISA Science 15 Years							530			532			516			513			508
PISA Reading 15 Years	529			522			521			521			512			509			506
% school leavers NCEA L2+					61%	58%	60%	66%	70%	71%	74%	72%	74%	74%	77%	79%	80%	81%	79%

Source: Education Counts, Annual Reports 2004–19, Website; Education Counts, "PISA 2018 – New Zealand Summary Report," Website.

New Zealand's other grave problem is its longstanding failure to raise educational equity. In some countries, schooling narrows the gaps between students like Tama and Lily. New Zealand does this markedly less successfully. For example, in the most recent round of PISA testing (2018), New Zealand recorded the strongest relationship between socioeconomic background and educational performance of all its comparator English-speaking countries. Educational inequity is worse here than in the US, Australia, Canada and the UK.[15]

Outcomes in New Zealand are also linked closely to ethnicity. For example, in 2019, while 64% of Asian and 44% of European

students left school with University Entrance (UE), the equivalent proportions for Pasifika and Māori students were 23% and 19%, respectively.[16]

So, what is child-centred education?

Broadly, child-centred schooling means handing over responsibility for learning to individual students. Aimed at nurturing independence and making students into active, responsible participants in their own learning, child-centred education prioritises students' interests, i.e. what they find most "relevant," "engaging" and "interesting." By wrapping schooling around what children *want* to learn – what coincides with their wellbeing today – the theory predicts that children will be naturally motivated and grow into "lifelong learners" while guided only minimally.

However, by prioritising students' interests, child-centred schooling undermines the knowledge contained in academic subjects. It sees classrooms run by authoritative teachers as stifling. For the follower of child-centred philosophy, the ongoing gaps between the attainment of children from different backgrounds only proves the failure of teacher and knowledge-led philosophy. In a child-centred classroom, the drill and practice needed to remember times tables, the names of continents, historical timelines and grammar are regarded as unnecessary and crushing creativity.

This is why today, open-plan spaces are increasingly replacing single-celled classrooms. It is why students are sitting on carpets or beanbags instead of at desks. To fit with child-centred orthodoxy, both the process and end goal of schooling has been overhauled. Through the 2007 New Zealand Curriculum (NZC), children "discover" and "create" their own knowledge. The focus is on competencies.

But this approach has education backwards. Both empirical research and cognitive science show that for school children, *direct* teaching of knowledge is the best *route* to competencies.[17]

Elsewhere in the world, policymakers and educators are waking up to the flaws in child-centred philosophy. In England, these ideas are in retreat following a dramatic curriculum overhaul in 2014. English schools are returning to knowledge and expecting teachers to lead. Scores in international assessments have already started improving.[18]

However, despite at least 15 years of decline, and a total failure to raise equity, New Zealand's educational establishment keeps doubling down on child-centred orthodoxy. Instead of introducing reforms based on evidence, child-centred idealists keep finding new ways to ignore reality.

For example, the previous National administration hid behind the façade of rising achievement in NCEA. Then in 2019, Education Minister Hipkins used PISA's latest findings of further decline to argue not for a review of philosophical assumptions or more evidence-based policy, but for "a greater focus on wellbeing."[19] By way of evidence for selecting this focus he cited the "overwhelming" message from the thousands of attendees at the two education summits he hosted in 2018.

Another example of public servants ignoring evidence in favour of pressure from interest groups also came in 2018. That year, the sole question on a Level 3 NCEA history exam included the quote: "Events of importance are the result of trivial causes." Within two days, thousands of the participating Year 13 students had signed a petition in protest. These products of a child-centred school system were unfamiliar with the word "trivial" and demanded the New Zealand Qualifications Authority (NZQA) mark their essays accordingly.

The chairman of the New Zealand History Teachers' Association (NZHTA) agreed, saying it was "unfair" to make comprehension part of the test and that a glossary should have been included. The NZQA judged similarly. In its response to the students' petition, the qualifications authority concluded that while it had expected the word trivial "to be within the range of vocabulary for a Level 3 History student," candidates would *not* be penalised for misinterpreting it.

NZQA's capitulation hints at how influential child-centred ideas have become in New Zealand. It exposes just how low expectations have fallen for the nation's students.

What does this report do?

This report unpacks the origins of child-centred philosophy and its impact on New Zealand. It describes the NZC, then compares its presuppositions with the current scientific consensus about how humans learn. It then lays out what is needed for a corrective shift.

Repairing the generational damage of this failed idea will take a coordinated effort. For many New Zealand educators, child-centred orthodoxy is like the air they breathe. It has redefined not only *how* to teach students, but even the purpose of school.

However, when all the reliable statistics show declining standards, worsening classroom climates and grave inequity, it is worth examining the system's plumbing – its underlying philosophy.

CHAPTER 1

Child-centred orthodoxy

I would label myself a political liberal and an educational conservative, or perhaps more accurately, an educational pragmatist. Political liberals really ought to oppose progressive educational ideas because they have led to practical failure and greater social inequity.
— E.D. Hirsch, Jr., *Reality's revenge: Research and Ideology*[20]

Liberal schooling

"Education is simply the soul of a society as it passes from one generation to another," as the writer G.K. Chesterton put it. Historically, schooling in New Zealand was shaped around the European ideal of a 'liberal education.' Unlike professional or vocational schooling, whose ultimate purpose is employment, liberal schooling focused on personal development and cultural transmission. It passed on to children the collective wisdom of their forebears.

Perhaps the most widely cited proponent of liberal education was Matthew Arnold, a 19th-century English educational reformer who worked as a school inspector. Concerned about the provincialism of the curriculum taught in too many classrooms at the time, Arnold wrote *Culture and Anarchy* (1869), which described how the coercive powers of the state must be harnessed to make a liberal education available to all.[21]

For Arnold, a liberal democratic society that prizes personal freedom requires as many thoughtful, independently minded citizens as it can muster. And the best way to develop children's

capacity for independent thought is through exposure to complex and worthwhile material – objective bodies of knowledge from the arts and literature to history and science. Such schooling can give children the space to contemplate, explore and respond to their society. As Arnold put it, schools should acquaint students with "the best that has been thought and said."

In the past few decades, official schooling policy in New Zealand has markedly changed from Arnold's liberal, knowledge-based vision. With the launch of NCEA in 2003–04 and the NZC in 2007, schooling has been reconstructed by "child-centred" orthodoxy.

Child-centred schooling

The origins of child-centred schooling lie in 18th-century romanticism, an artistic and intellectual movement that grew in response to the scientific enlightenment and industrialisation. Instead of rationalism and science, romanticism emphasised nature, emotion and individualism. Romanticism's influence on education has *even* misled popular opinion about the word's etymology (see Box 1).

BOX 1: The etymology of 'education'

According to widely held belief, the word 'education' derives from the Latin verb 'educere,' which means to 'lead out' or 'unfold.' Nowadays, the idea that education is a natural process of development is ubiquitous within educational discourse, and since to 'develop' literally means 'to unfold,' the Latin word 'educere' appears consistent. However, as the American educator and academic E.D. Hirsch, Jr. explains, 'educere' is not the true origin of the word. Rather, 'educere' is a mistranslation that was first made in the romantic period, and education actually derives from the similar-sounding but very different Latin verb 'educare', which means to 'bring up' or 'instruct.'

'Educare' fits with the cause of liberal schooling to acculturate students in the accumulated knowledge and norms of a society or culture. Even so, the 'educere' mistranslation is still widely used.

Perhaps the first romantic thinker to propose a distinction between education as acculturation and other desirable outcomes was the 18th-century Swiss philosopher Jean-Jacques Rousseau.

In *Emile, or On Education* (1762), Rousseau explored the complexity of educating both for citizenship and individuality. For Rousseau, the choice was stark between nurturing the inner life of the child and meeting the demands of society. "Forced to combat either nature or society, you must make your choice between the man and the citizen, you cannot train both."[22]

Through his imaginary character Emile, or 'Nature's pupil,' Rousseau made recommendations for what adults can do to preserve the natural wisdom, vigour and resilience of children. Broadly, Rousseau advised leaving them alone: "Nature provides for the child's growth in her own fashion, and this should never be thwarted. Do not make him sit still when he wants to run about, nor run when he wants to be quiet."[23]

Centuries later, in the 1960s, Brazilian educational philosopher Paulo Freire also questioned knowledge-focused schooling. In his famous book, *Pedagogy of the Oppressed*, Freire critiqued what he termed the 'banking' model of education whereby students must remember and recall information taught to them by their teacher. Writing for the New Zealand Council for Educational Research's (NZCER) *SET* publication in 1974 – the year he also visited and inspired reformers here – Freire described how 'banking' projected "an absolute ignorance onto others, a characteristic of the ideology of oppression."[24] In its place, he argued for treating the learner as a co-creator of knowledge.

Perhaps the most famous grandfather of child-centred education is the American philosopher and educator John Dewey. Dewey's writing in the early 20th century showed his worry that schools' narrow focus on the transmission of knowledge risked creating

compliance rather than citizens equipped to challenge authority. For Dewey, the rise of new styles of schooling was borne from discontent with traditional education.

> The traditional scheme is, in essence, one of imposition from above and from outside. It imposes adult standards, subject-matter, and methods upon those who are only growing slowly toward maturity. The gap is so great that the required subject matter, the methods of learning and of behaving are foreign to the existing capacities of the young. They are beyond the reach of the experience the young learners already possess. Consequently, they must be imposed; even though good teachers will use devices of art to cover up the imposition so as to relieve it of obviously brutal features.[25]

For followers of Dewey, to learn knowledge determined by an authority is unnatural; to impose knowledge onto children dulls individuality, saps motivation and crushes creativity.

Child-centred orthodoxy in New Zealand

In New Zealand, a land built on discovery, where nature's wonders abound, it is not hard to see the appeal of Rousseau's romantic idea that if only we left them alone, children would unfurl and flourish naturally. Young children regularly amaze us with how they develop naturally. It is thus unsurprising that some educators believe that, so long as they create the right conditions, this process will continue indefinitely.

Indeed, in 2012 the Education Review Office (ERO) said: "New Zealand prides itself on its child-centred approach to learning."[26]

In New Zealand, there are also historical reasons to have faith in forms of schooling that prioritise individuality. Under School Certificate, each year at least 50% of New Zealanders left school unqualified.

Despite this, most still went on to respectable careers. Consequently, many people do not see a great need for formal education.

Added to this, New Zealand is haunted by the persistent educational underperformance of Māori and Pasifika students.[27] Educators in New Zealand searching for explanations and solutions to this inequality were clearly drawn to Freire's insistence that knowledge is synonymous with oppression and Dewey's insistence that knowledge saps freedom. For some, because liberal schooling meant studying Western academic disciplines, it had always been an unwelcome "imposition."

Child-centred ideas arrived here courtesy of Dewey himself. In 1937, the NZCER helped host the New Zealand chapter of the New Education Fellowship Conferences, where 'new education' was another name given to Dewey's child-centred ideas.[28] The central theme of the conference, which was attended by thousands of teachers and lay people at sessions in Auckland, Wellington, Christchurch and Dunedin, was the reconstruction of schooling away from its traditional focus on academic outcomes and towards each child's individual needs. Through the conference and the subsequent elevation of Clarence E. Beeby, NZCER's then-director, to a 20-year tenure as head of the Ministry of Education, child-centred ideas became completely mainstream – the default philosophy.[29]

In many respects, a greater focus on the needs of each child was overdue. For example, before Beeby, national curriculum and assessment policies in New Zealand saw only relatively few children staying in education beyond age 15, and some not even beyond primary school. Few would wish a return to that elitist and selective era. However, in the years following the 1937 conferences, progressivism moved from an "idea to a pedagogical orthodoxy".[30] As well as transforming access and opportunity in education, Beeby's progressivism advanced the proposition that children flourish most when guided only minimally.[31]

Nowadays, the romantic language and presumptions of child-centred idealism are so pervasive in New Zealand as to be almost like the air we breathe. Yet, despite its appeal, adopting child-centred education uncritically has had damaging implications for *what* and *how* schools teach.

Both experimental evidence and the science of learning show that the most effective way for novices to gain knowledge of the world is to learn it from others – either directly or through a proxy like a book.[32] To recognise this, we need look no further than the format of most documentaries, press conferences or YouTube tutorials. However, in New Zealand, the explicit teaching of knowledge is often positioned in conflict with child-centred ideas. For example, Teach First NZ training programme director Dr Michelle Johansson – whose views influence cohorts of bright new trainee teachers each year – encouraged *The New Zealand Herald* readers to think "more about how a school can be a community of care, not a place to shove education down their throats."[33]

Having framed knowledge-based schooling and holistic, child-centred schooling as conflicting, Dewey's followers have advanced – intentionally or otherwise – two damaging transformations to education: the first, constructivist teaching affects *how* teachers teach; the second, 21st-century learning transforms *what* is taught or the purpose of school.

Transformation I: Constructivist teaching

Constructivism, as conceived by its founding father, the Swiss psychologist Jean Piaget, is the uncontroversial idea that we all, individually, construct our own learning. As a theory of *learning*, constructivism is well established.[34] After all, only a student can create and cement knowledge and understanding in their mind. Unfortunately, in many places including New Zealand, constructivism has been extended unhelpfully.

Jane Gilbert, professor of education at the Auckland University of Technology and former NZCER Chief Researcher, has explored the complexity and confusions associated with at least four meanings of 'constructivism.'[35] This report focuses only on its extension into a theory – widely encouraged in New Zealand – of how to *teach*.

The constructivist teaching approach aims to provide students with experiences so they will construct knowledge themselves. Rather than acquiring knowledge directly from adults, children lead their own learning, and hopefully, 'discover' it unaided. The logic goes that because they have been 'actively engaged' in discovering knowledge, they will be more likely to understand and remember it, and be more motivated. The constructivist teaching approach leads to the view that teaching knowledge directly is less effective than letting children construct it themselves.

In New Zealand, constructivist teaching frequently involves learning through inquiry, discovery or projects – conducted in groups or alone. Today's open-plan learning spaces are built to encourage and support these approaches. What unites them is the expectation that students will construct knowledge and understanding while being guided only minimally.

For example, during an inquiry-based lesson, pupils might operate like historians, work like musicians or think like scientists. During a discovery lesson, students might use the internet to research a topic, then report their findings to their class. Yet, as Chapter 3 explains, while these teaching approaches may be effective for students with significant background knowledge, they are far less so for novices.

Much of the appeal of constructivist teaching lies in the reasonable but incomplete assertion that teaching is effective when students are 'actively' engaged. This incomplete belief is expressed well in

the Confucian saying: "I hear and I forget. I see and I remember. I do and I understand."

However, the idea that as a consequence formal teaching is necessarily passive – that it leads students to forget, misunderstand or disengage – is deeply unhelpful.

Just because students appear busy researching on the internet, discussing in groups or operating a microscope does not mean they are learning better than if they had been silently listening, watching or reading. Just because pupils each choose the text they study in English does not mean they learn more than if the whole class were reading a text chosen by their teacher, or even prescribed nationally. As uplifting as it can be to observe it in a classroom, behavioural activity does not guarantee that pupils are optimally engaged mentally.

Instead, as educational psychologists Richard E. Clark, Paul A. Kirschner and John Sweller explain:

> Cognitive activity can happen with or without behavioural activity, and behavioural activity does not in any way guarantee cognitive activity. In fact, the type of active cognitive processing that students need to engage in to "construct" knowledge can happen through reading a book, listening to a lecture, watching a teacher conduct an experiment while simultaneously describing what he or she is doing, etc. Learning requires the construction of knowledge. Withholding information from students does not facilitate the construction of knowledge.[36]

This assertion from cognitive science is also echoed emphatically in statistical evidence.

The world's best-known statistical study of the effectiveness of educational interventions was conducted by John Hattie, education

researcher and former professor of education at the University of Auckland. In his book *Visible Learning* (2009), Hattie analysed more than 800 meta-analyses of the effects on pupil performance of 138 educational interventions.[37] The outcome was a list of 'effect sizes' of between 0, which denotes no change in achievement, and 1, which indicates an increase of one standard deviation in attainment.[38] When implementing a new programme, an effect size of 1.0 would mean that, on average, students receiving that treatment would exceed 84% of students not receiving it.

Hattie compiled a table comparing teaching methods where the teacher acted as 'activator' (i.e. in a traditional role) and 'facilitator' (in line with the constructivist teaching approach) (see Table 1). Hattie found that, on average, teachers following the more traditional approach achieved effect sizes of 0.6 compared to an almost negligible 0.17 for those using the constructivist approach.[39]

Table 1: Comparing the 'activator' or 'facilitator' roles of teachers

Teacher as activator	d	Teacher as facilitator	d
Reciprocal teaching	0.74	Simulations and gaming	0.32
Feedback	0.72	Inquiry-based teaching	0.31
Teaching students self-verbalization	0.67	Smaller class sizes	0.21
Meta-cognition strategies	0.67	Individualized instruction	0.20
Direct Instruction	0.59	Problem-based learning	0.15
Mastery learning	0.57	Different teaching for boys and girls	0.12
Goals – challenging	0.56	Web-based learning	0.09
Frequent/effects of testing	0.46	Whole language – reading	0.06
Behavioral organizers	0.41	Inductive teaching	0.06
Average activator	**0.60**	**Average facilitator**	**0.17**

Source: John Hattie, *Visible Learning: A Synthesis of over 800 Meta-Analyses Relating to Achievement* (New York: Routledge, 2009), 243.

With a starkness rarely found in educational research, Hattie's analysis indicated that despite the superficial appeals of constructivism, in practice, teachers are more effective when following the traditional approach.[40] Despite the oft-repeated adage that teachers should be 'guides on the side, not sages on the stage,' classrooms on average generate more progress for pupils when teachers take the lead.

In his concluding chapter, Hattie described "Perhaps the most famous example of policy makers not using or being convinced by evidence."[41] Designed to identify the most effective education innovations for breaking cycles of poverty through enhanced student learning, Project Follow Through (PFT), which started in 1967, was a massive 10-year study in the US involving more than 70,000 economically disadvantaged K–3 students.[42] PFT included a comparison of constructivist education models with those based on Direct Instruction and found conclusions similar to Hattie's.

> All but one program had close to zero effects (some had negative effects). Only Direct Instruction had positive effects on basic skills, on deeper comprehension measures, on social measures, and on affective measures. Meyer (1984) followed these students through to the end of their schooling, and those in the Direct Instruction compared to peers not in this program were twice as likely to graduate from high school.[43]

Yet, as Hattie noted, rather than heed these dramatic findings, educators in the US – like those in New Zealand – buried them because they did not fit with popular ideas. Instead, they doubled-down on child-centred practices, convinced they can and must be made to work.

> The outcome of this study, however, was not to support more implementation of Direct Instruction but to spend more resources on the methods that did not work but were preferred

> by educators. As Carnine (2000) commented, the romantic view of students discovering learning was more powerful than a method invented by a teacher that actually made a difference … The rejection of Direct Instruction in favor of Rousseian inspired methods "is a classic case of an immature profession, one that lacks a solid scientific base and has less respect for evidence than for opinion and ideology."[44]

Hattie's findings and conclusion could not be clearer. Yet, for decades teachers in New Zealand have been pressed, coaxed and cajoled by official policy and 'research' to follow child-centred ideas.[45]

Transformation II: '21st -century' learning through key competencies

The other way child-centred philosophy has transformed schooling has been to change its objective. Arnold's belief that liberal education should pass on 'the best that has been thought and said' is no longer central. Instead, NZC is clear that the purpose of schooling is to develop generic skills, otherwise called the five Key Competencies.[46]

The divergence from knowledge has also been bolstered by a disparate movement of employers, management consultants, supra-national organisations and futurist gurus who advocate '21st-century' skills. Their basic argument is that knowledge is growing and changing so rapidly that it is futile to build a curriculum on it; instead, we should focus on 'transferable' skills like critical thinking, research and teamwork. The idea that schooling must 'transform for the future' is widespread, particularly in the NZC.

In New Zealand, future-focused or '21st-century' educational discourse often references the work of Jane Gilbert. Her revolutionary book, *Catching the Knowledge Wave? The Knowledge*

Society and the Future of Education (2005), was built on the idea that "because we cannot know what we need in future, it is pointless trying to teach it in advance."[47]

> In the world outside education, knowledge's meaning is changing. Here, people are increasingly thinking of knowledge not as a thing, developed and stored in people, but as a kind of energy, something that does things. They are using the word knowledge as a verb, not a noun, as a process rather than a product.[48]

Like many proponents of 'transformation,' Gilbert says, "knowledge is still important" – just "not as an end in itself." The implication is (though many who underwent it would disagree) that knowledge-based schooling equips students only to reproduce knowledge, not to use it. Based on this perspective of traditional education, Gilbert successfully called on New Zealand to redefine the purpose of schooling.

Interestingly, Gilbert acknowledges on her back blurb that she wrote her book as a provocation rather than proven theory.[49]

> If this book were a film, it would be rated M – with a caution that "some viewers may be disturbed by some scenes." … This is a book to argue with, to agree or disagree with, but above all to *read* – the future of our public education system is at stake. [Emphasis in original]

Despite this warning, Gilbert's ideas have been taken up and referenced as proven, especially by the NZCER, which actively endorsed Gilbert's views even before her book was published.

For example, in 2002 the Ministry of Education commissioned a team of researchers, including the NZCER, to conduct a literature review of effective Curriculum, Learning and Pedagogy in Science.[50] Alongside two common purposes expected of science in

schools – educating for a career in science and for participating in democratic decision-making – the review identified a third 'future-focused' purpose: education for a "knowledge society." Referencing Gilbert, the review argued that the content currently taught in science encapsulated "old" knowledge, not likely to be relevant or valued in the future "knowledge society."[51]

In 2012, under the then-Minister of Education Hekia Parata, the Ministry commissioned the NZCER to summarise the research on 'futures-thinking in education.'[52] Despite coming five years into the implementation of New Zealand's radical new curriculum, "Supporting Future-Oriented Learning and Teaching – A New Zealand Perspective" (2012) continued to draw on Gilbert's work to argue for yet *more* transformational change. For example, it included a table (see Table 2) summarising some of the 'key shifts' in social organisation which Gilbert called the 'Knowledge Age.'

Even before the launch of the NZC, the idea that schooling must be 'transformed' for the '21st-century' had become part of the education zeitgeist in New Zealand. For example, in 2004, the Ministry's curriculum manager, Mary Chamberlain, wrote that "it's no longer possible to teach children everything they need for a lifetime because knowledge is growing too fast and our lives are too long. Knowing how to learn and knowing how to apply what is learned are critical."[53]

Referring to this same imagined dichotomy between knowledge and skills, in 2018 ERO declared that while "traditional education systems fostered the obedience demanded of the manufacturing workforce," nowadays "knowledge is available at the click of a mouse" so "the Education 3.0 system must nurture creative and collaborative skills."[54]

Table 2: Old and new views of knowledge, and the implications for schooling

Then	Now
• Knowledge was conceived of as something developed and known by experts, something that could be passed on from teacher to student, or manager to worker.	• Knowledge is rapidly created every day. Knowledge is the process of creating new knowledge. It is a product of "networks and flows"** coming into being through interactions and intersections on a "justin-time" basis to solve specific problems as they emerge.
• Schools' job was to transmit this knowledge to students, and students' job was to absorb this knowledge in preparation for their lives after school. • Curriculum development was seen as the straightforward task of determining which knowledge students would need for their future roles, and organising this knowledge "into logical sequences of curriculum units that can be taught using expository, step-by-step methods, and assessed in ways that produce apparently clear, unambiguous results".*	• It is no longer possible to accurately predict exactly which knowledge people will need to draw on as they move through life in the 21st century. It has been argued that students need, among other things, opportunities to build their sense of identity, become self-reliant, critical and creative thinkers, be able to use initiative, be team players and be able to engage in ongoing learning throughout their lives.
• These structures also assumed a certain degree of stability and predictability in the kinds of jobs and social roles that people could move into once they left school.	• The kinds of jobs and social roles that people move into once they leave school are constantly evolving as a consequence of social, economic and technological developments, and an increasingly globalised, interconnected and interdependent world. In 21st century society, people who are able to work with knowledge are seen as a key resource for economic—and social—development.

Source: Rachel Bolstad, et al. "Supporting Future-Oriented Learning and Teaching – A New Zealand Perspective" (Wellington: Ministry of Education, 2012).

* Castells (2000).
** Bolstad and Gilbert (2008, p. 19).

In 2019, the Productivity Commission cited NZCER's advocacy of '21st-century' learning as proven theory: "Evidence suggests that competency-based learning is well-suited to an uncertain future."[55] The only source for this pivotal claim was the 2012 NZCER report: "It is argued that education for the Knowledge Age must

foreground the development of learners' dispositions, capacities or competencies to deal with new situations and environments."[56]

Many things may be argued, but it does not make them true. There is still *no* evidence that 'foregrounding competencies' effectively ensures they are widely achieved.

Of course, technological advances such as search engines like Google have made information more accessible, and are frequently a good thing. Likewise, automation will continue to eliminate more forms of low-skilled labour and schooling should respond to this.

However, to assume that the best response to these modern realities should be to cast aside the very knowledge that has enabled these advances is neither rational nor expedient. It needs only a cursory application of this idea to the real world to realise how misconceived it is. Just imagine its application to the study of medicine. Few would want to be treated by a doctor whose tutors had decided that, since medical knowledge is evolving so fast, trainees should be taught *how* to learn rather than the best that we know about the human body, illnesses, diseases and remedies.

It is profoundly naive to assume that because we now have smartphones we should sideline knowledge and instead focus on skills. The notion that the proliferation of new information or of search engines like Google renders knowledge in long-term memory less important is untrue. Our working memories are limited, so we must draw on knowledge stored in our long-term memory to solve complex problems (see Chapter 3). Even the act of looking something up on Google relies on having substantial knowledge in our long-term memory with which to process what we find. We need knowledge to understand what we read and to decipher fact from fiction. Not having background knowledge greatly reduces our ability to do this.

As the British teacher and author Daisy Christodoulou explained in *Seven Myths About Education* (2014), if more people are going to need highly developed skills:

> We need to make sure that everyone gets the education that was in the past reserved for the elite. That is not redefining education for the twenty-first century: it is giving everyone the chance to get a traditional education.[57]

There is nothing transformational or '21st-century' about competencies. Skills and behaviours such as thinking, relating to others and using language, symbols and texts (three of the NZC's five Key Competencies) have been desirable – and achieved – outcomes of schooling for decades. Yet, uncritical adherence to 'knowledge age,' 'future-focused' and '21st-century' ideas have lurched our curriculum *away* from subject knowledge towards vague competencies.

As a measure of just how eagerly New Zealand has adopted future-focused, skills-based transformation, in 2017, the Economist Intelligence Unit in London judged New Zealand to lead the world in "educating for the future."[58] Despite our declining standards and grave educational inequity, its league table still judged New Zealand world leading because it was based on inputs to schooling, rather than outputs. In particular, it reflected our curriculum's focus on 'future-skills.'

Conclusion

Child-centred ideas were first introduced to New Zealand in the 1930s, a time when teachers like the 'Gradgrind' described in Dickens' 1854 novel *Hard Times* likely still existed. Since then, child-centred ideas have evolved from calling for greater focus on the needs of individual students to a far-reaching and damaging orthodoxy.

Today, child-centred ideas tell teachers to step aside and let their children lead. And because this has proven to be an ineffective way to accumulate knowledge, proponents of child-centred philosophy now advocate alternative objectives. Instead of passing on "the best that has been thought and said," the national curriculum in New Zealand is now focused on '21st-century' competencies. It is to the NZC that this report now turns in Chapter 2.

CHAPTER 2

The New Zealand Curriculum

> *Progressive educators have defended their aversion to knowledge with pseudo-science, sociological attacks on 'elitism', and the supposedly unprecedented pace of technological change. However, at the root of these arguments remains a sentimental aversion to the idea that schools should be defined by anything so hierarchical as the transmission of knowledge from the teacher to the child.*
>
> — Robert Peal, *Progressively Worse: The burden of bad ideas in British schools*[59]

Until the early 1990s, New Zealand's national curriculum was made up of more than a dozen detailed syllabi and guidelines.[60] The subject knowledge prescribed was further reinforced by New Zealand's knowledge-based national assessments – School Certificate, Sixth Form Certificate and University Entrance (UE).

Following a major public consultation in the mid-1980s, a much altered New Zealand Curriculum Framework (NZCF) and parallel Te Anga Marautanga o Aotearoa were launched in 1993. The Ministry of Education's own stocktake report summarised the NZCF: "Curriculum policy shifted from a focus on content to a policy based on outcomes."[61] The University of Auckland's Professor Peter Roberts judged similarly:

> "Knowledge and understanding", while not altogether invisible in the Framework, are very much in the background.

> The Framework implies that all significant forms of learning – indeed, all human activity – can be categorised in terms of so many skills. [62]

Then, in 2007, today's New Zealand Curriculum, which is even less detailed than the 1993 'framework,' was introduced. NZCER Chief Researcher Rosemary Hipkins explained in 2010:

> This curriculum represented quite a departure from the more detailed, outcomes-focused curriculum documents of the 1990s. Rather than seven separate curriculum books, one for each learning area, NZC provides a framework for the school curriculum from year 1 to year 13. The whole of the nationally mandated curriculum is now outlined in one slim book. Every school has to work out how to build up a more detailed local curriculum based on this national framework.[63]

Unlike the old subject syllabi, the Achievement Objectives in NZC's eight Learning Areas are intentionally loose. Rather than prescribing the content to teach at each Curriculum Level, the NZC prioritises flexibility to localise the curriculum. It leaves all knowledge decisions to schools.

Take for example the learning area of Social Sciences. The equivalent curriculum statements in the (already much condensed) NZCF took up 24 pages, but in today's NZC they take up only a single A4 page for the whole of primary and secondary school (see Table 3 where it is reproduced over a page and a half to make it readable in A5).

Table 3: Curriculum achievement objectives by learning area

LEVEL ONE

Students will gain knowledge, skills, and experience to:

Social Studies

- Understand how belonging to groups is important for people.
- Understand that people have different roles and responsibilities as part of their participation in groups.
- Understand how the past is important to people.
- Understand how places in New Zealand are significant for individuals and groups.
- Understand how the cultures of people in New Zealand are expressed in their daily lives.

LEVEL TWO

Students will gain knowledge, skills, and experience to:

Social Studies

- Understand that people have social, cultural, and economic roles, rights, and responsibilities.
- Understand how people make choices to meet their needs and wants.
- Understand how cultural practices refl ect and express people's customs, traditions, and values.
- Understand how time and change affect people's lives.
- Understand how places influence people and people influence places.
- Understand how people make significant contributions to New Zealand's society.
- Understand how the status of Māori as tangata whenua is significant for communities in New Zealand.

LEVEL THREE

Students will gain knowledge, skills, and experience to:

Social Studies

- Understand how groups make and implement rules and laws.
- Understand how cultural practices vary but reflect similar purposes.
- Understand how people view and use places differently.
- Understand how people make decisions about access to and use of resources.
- Understand how people remember and record the past in different ways.
- Understand how early Polynesian and British migrations to New Zealand have continuing
- significance for tangata whenua and communities.
- Understand how the movement of people affects cultural diversity and interaction in New Zealand.

LEVEL FOUR

Students will gain knowledge, skills, and experience to:

Social Studies

- Understand how the ways in which leadership of groups is acquired and exercised have consequences for communities and societies.
- Understand how people pass on and sustain culture and heritage for different reasons and that this has consequences for people.
- Understand how exploration and innovation create opportunities and challenges for people, places, and environments.
- Understand that events have causes and effects.
- Understand how producers and consumers exercise their rights and meet their responsibilities.
- Understand how formal and informal groups make decisions that impact on communities.
- Understand how people participate individually and collectively in response to community challenges.

LEVEL FIVE

Students will gain knowledge, skills, and experience to:

Social Studies

- Understand how systems of government in New Zealand operate and affect people's lives, and how they compare with another system.
- Understand how the Treaty of Waitangi is responded to differently by people in different times and places.
- Understand how cultural interaction impacts on cultures and societies.
- Understand that people move between places and how this has consequences for the people and the places.
- Understand how economic decisions impact on people, communities, and nations.
- Understand how people's management of resources impacts on environmental and social sustainability.
- Understand how the ideas and actions of people in the past have had a significant impact on people's lives.
- Understand how people seek and have sought economic growth through business, enterprise, and innovation.
- Understand how people define and seek human rights.

LEVEL SIX

Students will gain knowledge, skills, and experience to:

Social Studies

- Understand how individuals, groups, and institutions work to promote social justice and human rights.
- Understand how cultures adapt and change and that this has consequences for society.

History

- Understand how the causes and consequences of past events that are of significance to New Zealanders shape the lives of people and society.
- Understand how people's perspectives on past events that are of significance to New Zealanders differ.

Geography

- Understand that natural and cultural environments have particular characteristics and how environments are shaped by processes that create spatial patterns.
- Understand how people interact with natural and cultural environments and that this interaction has consequences.

Economics

- Understand how, as a result of scarcity, consumers, producers, and government make choices that affect New Zealand society.
- Understand how the different sectors of the New Zealand economy are interdependent.

Table 3 cont.

LEVEL SEVEN	LEVEL EIGHT
Students will gain knowledge, skills, and experience to: **Social Studies** • Understand how communities and nations meet their responsibilities and exercise their rights in local, national, and global contexts. • Understand how conflicts can arise from different cultural beliefs and ideas and be addressed in different ways with differing outcomes. **History** • Understand how historical forces and movements have influenced the causes and consequences of events of significance to New Zealanders. • Understand how people's interpretations of events that are of significance to New Zealanders differ. **Geography** • Understand how the processes that shape natural and cultural environments change over time, vary in scale and from place to place, and create spatial patterns. • Understand how people's perceptions of and interactions with natural and cultural environments differ and have changed over time. **Economics** • Understand how economic concepts and models provide a means of analysing contemporary New Zealand issues. • Understand how government policies and contemporary issues interact.	Students will gain knowledge, skills, and experience to: **Social Studies** • Understand how policy changes are influenced by and impact on the rights, roles, and responsibilities of individuals and communities. • Understand how ideologies shape society and that individuals and groups respond differently to these beliefs. **History** • Understand that the causes, consequences, and explanations of historical events that are of significance to New Zealanders are complex and how and why they are contested. • Understand how trends over time reflect social, economic, and political forces. **Geography** • Understand how interacting processes shape natural and cultural environments, occur at different rates and on different scales, and create spatial variations. • Understand how people's diverse values and perceptions influence the environmental, social, and economic decisions and responses that they make. **Economics** • Understand that well-functioning markets are efficient but that governments may need to intervene where markets fail to deliver efficient or equitable outcomes. • Understand how the nature and size of the New Zealand economy is influenced by interacting internal and external factors.

Source: Ministry of Education, "The New Zealand Curriculum," Website.

Until Level 6 (about Year 11), history, geography, social studies and economics are described together through bullet points like these:

- Understand that events have causes and effects (Level 4);
- Understand how the ideas and actions of people in the past have had a significant impact on people's lives (Level 5).

Comparing with an equivalent curriculum helps illustrate just how high-level and flexible the NZC is. Table 4 shows the contrast between just the geography national curriculum for Years 1 and 2 in England, and NZC's equivalent for all of social science (which includes geography, history and social studies).

While the English version identifies specific material, like the names of continents and oceans, the NZC is content-free. England's curriculum leaves plenty of room for teachers to link learning to local contexts and children's interests, while ensuring all children experience a core canon of subject knowledge and vocabulary.

Table 4: Contrasting New Zealand's curriculum for all the social sciences with England's geography curriculum (both for Years 1 and 2)

NEW ZEALAND – Social Science	ENGLAND – Geography
LEVEL ONE	**KEY STAGE ONE**
Students will gain knowledge, skills, and experience to: **Social Studies** • Understand how belonging to groups is important for people. • Understand that people have different roles and responsibilities as part of their participation in groups. • Understand how the past is important to people. • Understand how places in New Zealand are significant for individuals and groups. • Understand how the cultures of people in New Zealand are expressed in their daily lives.	Pupils should develop knowledge about the world, the United Kingdom and their locality. They should understand basic subject-specific vocabulary relating to human and physical geography and begin to use geographical skills, including first-hand observation, to enhance their locational awareness. Pupils should be taught to: **Locational knowledge** • name and locate the world's seven continents and five oceans • name, locate and identify characteristics of the four countries and capital cities of the United Kingdom and its surrounding seas **Place knowledge** • understand geographical similarities and differences through studying the human and physical geography of a small area of the United Kingdom, and of a small area in a contrasting non-European country **Human and physical geography** • identify seasonal and daily weather patterns in the United Kingdom and the location of hot and cold areas of the world in relation to the Equator and the North and South Poles • use basic geographical vocabulary to refer to: – key physical features, including: beach, cliff, coast, forest, hill, mountain, sea, ocean, river, soil, valley, vegetation, season and weather – key human features, including: city, town, village, factory, farm, house, office, port, harbour and shop **Geographical skills and fieldwork** • use world maps, atlases and globes to identify the United Kingdom and its countries, as well as the countries, continents and oceans studied at this key stage • use simple compass directions (North, South, East and West) and locational and directional language [for example, near and far; left and right], to describe the location of features and routes on a map • use aerial photographs and plan perspectives to recognise landmarks and basic human and physical features; devise a simple map; and use and construct basic symbols in a key • use simple fieldwork and observational skills to study the geography of their school and its grounds and the key human and physical features of its surrounding environment.

Source: Ministry of Education, "The New Zealand Curriculum," Website; Department for Education (UK), "The National Curriculum in England: Key Stages 1 and 2 Framework Document" (London: 2013).

The NZC is a framework that schools can populate with knowledge. Not prescribing knowledge does not automatically mean knowledge is missing from classrooms. Indeed, literature is still studied in English, formulae are still learned and used in physics and stories and sources are still explored in history. However, because the NZC is agnostic about content, it propounds that all knowledge is equally valuable, that children's individual interests are more important than disciplinary structures and coherence.

BOX 2: The contents of the NZC

The NZC comprises a visionary 'front half' and a 'back half' covering all learning areas.

The 'front half' constitutes:

- A vision statement describing what we want for our young people, particularly in becoming "confident, connected, actively involved lifelong learners;"
- Eight principles that should be the foundation of curriculum decision-making: high expectations, the Treaty of Waitangi, cultural diversity, inclusion, learning to learn, community engagement, coherence and future focus;
- Eight values to be encouraged, modelled and explored: excellence, innovation, inquiry and curiosity, diversity, equity, community and participation, ecological sustainability and integrity and respect;
- Five key competencies students should learn to use in order to live, learn, work and contribute as active members of their communities: thinking; using language, symbols and texts; managing self; relating to others; and participating and contributing.

The 'back half' of the curriculum describes the eight compulsory learning areas of English, the arts, health and physical education, learning languages, mathematics and statistics, science, social sciences and technology. In particular, these descriptions, each of which fits on one page, focus on what the learning area is about, why students should study it and how it is structured. Building on these, the NZC website provides achievement objectives for all eight learning areas across the eight curriculum levels. Table 3 shows, as an example, all the achievement objectives for social science.

Finally, at the very end of the NZC are three pages on 'Effective Pedagogy,' six pages on how to design and review a school's curriculum and a page outlining the requirements of Boards of Trustees.

> Schools are required to base their curriculum on the principles of the New Zealand Curriculum, to encourage and model the values, and to develop the key competencies at all year levels.[64]

And while Years 1–10 teachers are "required to provide teaching and learning" in all learning areas (excluding learning languages), they need only "select achievement objectives from each area in response to the identified interests and learning needs of their students."

The curriculum thus makes clear that while principles, values and key competencies are required, achievement objectives exist only to be selected from – schools can and should pick and choose.

By expecting teachers to 'put students at the centre,' the NZC communicates that rather than starting from the disciplinary knowledge selected by experts and taken from beyond children's experiences, curriculum decisions should be based on what individual students find most engaging and challenging.[65] This approach is further bolstered by the belief that following students' unique preferences and interests will motivate them more.

In 2019, Whetu Cormick, the then-president of the New Zealand Principals' Federation, accidentally exposed the damaging consequence of this belief while commenting on NZC's vast flexibility. Cormick said it was right to let teachers choose topics on the basis of students' interests: "For a child in Bluff who might be interested in muttonbirds, they are not going to be interested in the fact that there are seven continents in the world."[66]

It was a chilling statement. And yet, Cormick's extreme, anti-knowledge position is mainstream in New Zealand.

In fact, for proponents of the NZC, an important explanation for many children's poor behaviour and lack of engagement is the irrelevance of traditional, subject-based curricula. Accordingly, today's child-centred curriculum is positioned as a crucial component of the essential effort to keep all children engaged. Despite this, attendance figures in New Zealand are appallingly low and in long-term decline. For example, last year just 58% of students attended school at least 90% of the time, compared to 87% of students in England.[67]

By placing the highest priority on meeting the needs and interests of individual children, the NZC ensures schooling is no longer about acculturation in the best that has been thought and said. Whether intentionally or otherwise, it creates space for utilitarian objectives like training for work and meeting the needs of the economy. It has also paved the way for making alternative objectives the priority of schools. In a powerful example of this, the new Education and Training Bill says school boards must now give *equal* priority (alongside student attainment) to supporting wider government imperatives for wellbeing, inclusion and the Treaty of Waitangi.[68]

Rather than using the most potent findings from each sub-discipline, science education in New Zealand is increasingly focused on reacting to real-world issues and evaluating scientific claims in "publicly communicated information."[69] Similarly in history, while the government has announced the creation of a relatively narrow curriculum for New Zealand's history, it has entirely neglected the wider history of civilisations.[70] Students of unabridged Shakespeare are judged equally to those who study the lyrics of 'more relevant' artists like Tupac or David Bowie.

To dumb down content to make it relevant has even become a sign of professionalism, as demonstrated in the following story recounted by a New Zealand English teacher:

A teacher presented alongside a staff member from what was then the University of Auckland's professional development arm for education. The session was about how to improve results in Formal Writing – one of the most commonly used internally assessed Level 1 NCEA standards. The assessment requires students to write a short piece of persuasive writing on a topic of their choice.

The first time he had taught pupils for this standard, the teacher had steered his class towards conventional topics like vegetarianism, recycling, pollution, racism, homelessness and social media. For whatever reason, his students just could not produce a persuasive 350 words on such topics. The results were terrible. However, following advice from experts at the University of Auckland, the following year he asked his students to pick their favourite lolly and make the case for why it was better than any other. As a result of this more 'relevant' topic choice – what was described to us as 'culturally responsive' pedagogy – engagement and results went through the roof. Many students even achieved excellence grades.

Though it was never explicitly stated, the implication was that low decile students could not relate to topics like the environment, politics or society. Because of this, teachers must find topics that students found fun, that they were experts in, and that reflected their immediate concerns and social world. If we really cared about improving outcomes for the poor, then we would use the NZC and NCEA's vast flexibility to make all our children engage and 'succeed.'

Such deference to relevance explains why the NZC exacerbates variations between classrooms and schools. Rather than having a narrowing effect, it intensifies inequity.

By transferring all curriculum decision-making to teachers and schools, the NZC has turned the curriculum into a lottery. Teachers

who stick to the unfashionable reality that for the most part, they (as subject experts) know better than their students what knowledge they need to master do so contrary to official advice. Teachers who defend and teach an established body of disciplinary knowledge do so subversively[71] and against ERO's claim that "the New Zealand Curriculum … is the envy of educators in other countries."[72]

The NZC may be esteemed by educators in parts of Scotland, Wales, Australia and the US that remain blighted by child-centred orthodoxy. However, it is unlikely to be the envy of educators in countries like Singapore and Estonia, which top international league tables of educational performance.

BOX 3: The way we teach children to read[73]

One particularly troubling implication of the assumption that "nature knows best" manifests in the way the Ministry of Education advises and supports teachers of early reading. Decades of research on how the brain learns to read (known as the Science of Reading) demonstrate that teaching children to decode words is necessary and best achieved through a structured phonics-based approach.[74]

Despite this, the Ministry of Education has neglected the teaching of phonics. Instead, it spends about $25 million annually on Reading Recovery, a remedial programme based on whole-language theory.[75]

Whole-language theory says learning to read is a natural, unconscious process – just like learning to speak. Proponents advise that reading is best developed by exposure to whole texts.

However, whole-language approaches have been repeatedly proven less effective than structured phonic-based approaches. In *Visible Learning*, Hattie said phonics instruction has an effect size of 0.6 compared to an effect size of 0.06 (virtually non-existent) for whole-language instruction.[76]

> Overall, phonics instruction is powerful in the process of learning to read – both for reading skills and for reading comprehension …

> Whole language programs have negligible effects on learning to read – be it on word recognition or on comprehension … It appears that strategies of reading need to be deliberately taught, especially to students struggling to read.

For many years, Professors Bill Tunmer and James Chapman from Massey University have urged the Ministry of Education to heed the science of reading and support teachers accordingly. Between 2015 and 2017, Massey University conducted workshops and research commissioned by the MoE aimed at better supporting teachers to develop early reading.

As a consequence of Massey's findings, in June 2019 the Ministry made a move towards evidence-based practice: It invited proposals for a revised set of books that would "incorporate a more deliberate and explicit progression of a phonemic/word level learning."[77] However, when *The New Zealand Herald* described the move as a U-turn, the Ministry rejected the description, calling it "inaccurate and misleading."

In seeking proposals, the Ministry admitted that New Zealand has "one of the largest gaps in literacy learning outcomes among developed countries."[78] It also admitted that the gap widens after children start school. However, instead of embracing a policy change, the Ministry referred to its invitation as 'business as usual'.

Despite the evidence, whole-language approaches remain influential in the Ministry of Education. This reality was revealed in Chapman and Tunmer's critique of a recent paper, *The Literacy Landscape in Aotearoa New Zealand*, by the the Ministry of Education's Science Advisor (ESA), Stuart McNaughton.[79] Chapman and Tunmer detailed six important questions that McNaughton, who is a Professor of Education at Auckland University, had overlooked. These included a failure to cite international expert panels on early reading development and the substantial research on the shortcomings of Reading Recovery.

Note: Reading Recovery was designed by The University of Auckland alumna Dame Marie Clay. Her programme is now overseen and sold globally by the Marie Clay Literacy Trust, whose board of three trustees incudes Stuart McNaughton. The National Reading Recovery Centre is also based at the Faculty of Education at The University of Auckland.

Are knowledge and competencies a false dichotomy?

Sometimes, advocates of knowledge-based education are accused of creating a false dichotomy.[80] In response to criticisms of the NZC's competency focus, defendants say the NZC was never designed to eliminate knowledge; rather, it was meant to ensure competencies were no longer overlooked and to make knowledge selection more responsive and relevant to students' needs.

However, this argument fails to acknowledge that it was NZC's reification of competencies *over* disciplinary knowledge that created this unhelpful dichotomy in the first place.

Previously, both competencies and knowledge were conceived and developed through subject disciplines. Competencies like thinking, 'managing self,' and using language symbols and texts grew in different ways through the study of subjects like the arts, maths, science and history. For example, by studying comparative art, students learned how cultures are shaped and reflected aesthetically. By memorising and using formulae in physics, students gained an understanding of abstract concepts and developed disciplined thinking patterns. By studying opposing interpretations of historical events, pupils built their capacity to think critically.

Some classrooms may have seen too much rote learning of facts, too little engagement and too few opportunities for critical thinking or student agency. However, the solution was not to transform the curriculum by placing disciplinary learning secondary to competencies. By doing that, the NZC undermined the organising framework – subject disciplines – that previously held knowledge and skills together. It also implied 'knowing that' is somehow inferior to (and unnecessary for) 'knowing how.'

The NZC created a new dichotomy by encouraging teachers to treat 'skills' like critical thinking as though they are generic rather

than unique and specific to the contexts of each discipline. A 2018 NZCER retrospective on the evolution of key competencies hinted at this mistake.[81] Describing a conference on key competencies the NZCER had hosted, the authors recall how "the idea that key competencies should be taught through the learning areas was first raised" in 2006, but "not taken up in a more systematic way until at least phase 3."[82] According to NZCER's ordering, phase 3 began around 2014.

Clearly, the idea that schools should continue to organise themselves around learning areas (the closest thing to subjects in the NZC), with key competencies woven in, rather than the other way round, had been on the NZCER's radar since before the launch of the NZC. That it was overlooked, and that it took eight more years for them to acknowledge (but not explicitly), points to how doggedly the NZCER, and the Ministry it advises, has tried to transform schooling through key competencies.[83]

Another nudge towards realising the knowledge-bound nature of competencies came in 2012. In "*Dislodging Knowledge? The New Zealand Curriculum in the 21st Century*," Victoria University's Bronwyn Wood and Mark Sheehan explained:[84]

> The prevailing focus of implementing this curriculum has been upon student-centred pedagogies and competencies, the integration of traditional disciplines and ICT (Information and Communication Technologies). We argue that this focus has the potential to sideline, or 'dislodge' the 'knowledge' component of the curriculum …
>
> The failure to be explicit about the place of knowledge in the New Zealand Curriculum has seen teachers valuing the 'how' (processes of learning/skills and competencies) over the 'what' (the content and knowledge).[85]

Since then, NZCER publications on competencies have been careful to acknowledge the role of knowledge.[86]

Yet, it will take much more than buried caveats to reverse the effect of years of advocating schools to 'foreground' competencies.[87]

BOX 4: Modern or flexible learning spaces

An example of the uncritical adoption of 'child-centred' and 'future-focused' ideas in New Zealand is the Ministry of Education's active promotion of 'modern' or 'flexible' learning environments, which enable a child-centred and skills-based approach.

Although the Ministry says it does not impose this style of classroom on schools, a 2018 report on innovative learning by ERO indicated otherwise. By making all new learning spaces 'flexible' (FLSs), the Ministry is changing what and how schools teach:[88]

> When planning new projects the Ministry works with the school concerned to arrive at a design that will support their vision for teaching and learning, though any design must be sufficiently flexible to allow for repurposing in the future if required. FLSs facilitate, *indeed necessitate*, changes in the curriculum and pedagogy. (Emphasis added)

The Ministry's clear preference for changes in curriculum and pedagogy is not shared by all schools. Steven Hargreaves is the Principal of Auckland's Macleans College – a school with more than 2500 pupils and some of the highest scholarship statistics in the country. According to Hargreaves, "specialist teachers work best in classrooms dedicated to a single class."[89] Despite this, Macleans was locked in a lengthy battle with the Ministry to achieve what it wanted for its new classrooms.

Whether children learn better in single-cell or open-plan classrooms is a testable proposition. Yet, no worthwhile New Zealand study has been conducted. Instead, the Ministry funded research investigating "how teachers can use the untapped potential of Innovative Learning Environments (ILEs) to improve learning outcomes."[90] The Ministry's preference for ILEs was a foregone conclusion of the research. Whether students learn more in ILEs than in single-cell classrooms still needs to be studied.

Conclusion

This report is not a critique of competencies, which are crucial. It does not critique schools for preparing children for future employment: this has always been a valuable and happy by-product of effective knowledge-based schooling.[91] This report also does not reject constructivist teaching: there are instances when students have gained sufficient knowledge to be able to learn like experts and benefit from some freedom. There are even instances when teachers might justifiably adopt a 'less effective' method if it builds motivation or variety.

However, this report *does* critique the means of schooling advocated by the NZC. It *does* critique the educational establishment's failure to recognise that knowledge is the *route* to competencies – that skills are not generic but intimately interwoven with the knowledge in subject disciplines. By seeing knowledge and skills as a dichotomy, or as outcomes that compete for lesson time, the NZC fails to recognise that if teachers focus on knowledge, competencies can and do naturally follow in appropriate contexts. The NZC fails to recognise that focusing prematurely on competencies leaves students less likely to master the knowledge essential to them.

Change is a necessary hallmark of progress. The history of education shows we have much to be grateful for to those who advocated change. For example, for decades children were punished for speaking their native Māori, and corporal punishment was permitted until 1990 in New Zealand schools.

Similarly, change is essential to disciplines and the school subjects that derive from them. No discipline, not even Latin, benefits from or warrants immunity from change.

However, despite what so many educational experts say, there is nothing revolutionary about '21st-century' skills. Rather, skills like

problem-solving, collaborating and thinking critically have been essential to human survival since our cave days.

Similarly, the 'future-focused' issues identified in the NZC "sustainability, citizenship, enterprise, and globalisation" have been around for hundreds of years.[92] The only difference is that today we expect students to address them without first grounding them in the disciplinary knowledge necessary to give the issues meaning.

Today, it *is still* possible to attend New Zealand schools where pupils gradually accumulate knowledge from the subject disciplines that has been sequenced coherently and taught directly. However, the schools that do this act *against* the advice of the NZC. They do this *despite* the overwhelming message that children's interests should lead. They do this even though teachers are trained to believe that direct instruction and disciplinary knowledge-based schooling is opposed to diversity, creativity and individuality.

Gradually, as teachers and leaders trained under previous curricula retire, fewer schools will be motivated to pursue liberal, knowledge-focused schooling. Already, schools that do this tend to be in areas that serve more professional and educated communities.[93]

As they retire, older generations of expert subject teachers – themselves educated under the liberal model – will be replaced by teachers educated under the 2007 NZC. Not even the wealthy will be able to find schools that teach the knowledge all children need.

In the meantime, more and more Kiwi children are attending schools where teachers do not lead, where children's 'interests' determine how they pass their formative years.

As a teacher in a decile 1 New Zealand primary school recounted:

> For the last five years our school has been involved in a ministry-funded professional development project for maths teaching. However, the facilitators have never bothered to collect any attainment data from us whatsoever. Meanwhile, it's obvious to everyone with half a brain that achievement has plummeted, with many senior students struggling to add single digit numbers.
>
> The approach uses mixed ability groups and word-based problems. Explicit teaching is discouraged in favour of students sharing outcomes at the end. And when knowledge is taught, it doesn't have to be connected to the problems being solved. Teachers are told not to interfere with students' problem solving, even if they are doing it wrong, as it will diminish the students' 'status.' We've also been told that students getting the correct answer isn't important.
>
> I find it totally shameful that this work is taking place with no regard for hard evidence, and worst of all it's mostly in low decile schools (where parents are less likely to complain). It's a real 'emperor's new clothes' situation. However, the facilitators keep telling us that their approach is 'culturally sustainable' – so who can argue with that?!

It would be hard to imagine a national curriculum and accountability structure better designed to tolerate such poor practices and exacerbate inequity. Yet, despite the damage it wreaks, such child-centred programmes still attract Ministry funding and dominate discourse and policy.

Ultimately, child-centred orthodoxy commands a kind of religious allegiance that shields it from scrutiny. For its disciples, its continued failure according to independent metrics (like PISA, PIRLS and TIMMS assessments) points either to flaws in the metrics or teachers' need for yet more support.[94]

Despite the former negating the latter, both these sentiments were summarised by Cathy Wylie, Chief Researcher at NZCER and a leading member of the Tomorrow's Schools Review taskforce.

> Thinking of PISA as the best test of New Zealand's education system is "very foolish". All this about ranking is irrelevant ... [Instead] changing the downward trend in PISA statistics will come about by providing the correct support for teachers. So far, that support has not been sufficient.[95]

As Appendix 2 shows, the NZCER has already produced at least 20 documents (many of them Ministry funded) on the why and how of key competencies. Apparently, this is not enough. For the believer, no amount of support will ever be enough. No amount of contrary evidence will lead to questioning core beliefs.

If New Zealand's inexorable slide into educational mediocrity is to be avoided, a radical reassessment of child-centred dogma is imperative.

CHAPTER 3

Rejecting cognitive science in New Zealand

Whaowhia te kete mātauranga (Fill the basket of knowledge)
— Māori proverb

Introduction

As with many myths, there is an element of truth in the belief, widely expressed in the NZC, that schools can and should teach competencies like critical thinking, communication and participation. School leavers who can only recall knowledge are far less valuable to themselves and the world than those who can use and apply it.

However, curriculum discourse and official literature on education in New Zealand fails to acknowledge the inseparable relationship between knowledge and skills – even though it has been demonstrated both empirically and by cognitive science.

Cognitive science is a relatively new, interdisciplinary field of study that draws on research from psychology, neuroscience and computing. In the past three decades, thanks in part to the proliferation of research into artificial intelligence, significant advances have been made in understanding human cognition. However, as this chapter shows, critical findings from cognitive science are being ignored, while uncritical faith in child-centred and skills-based schooling still dominates discourse in New Zealand.

The clash of science with child-centred theory

In 2014, the Ministry of Education welcomed an American, Benjamin Riley, for an Ian Axford Fellowship in Public Policy. Riley's subsequent report, "Science, Data and Decisions in New Zealand's Education System," exposed the clash between science and values that plagues educational research in New Zealand.

Specifically, Riley drew attention to the comparison between the international scientific consensus about learning and the "different and in many ways contradictory advice" given to educators and policymakers in New Zealand.[96]

For example, Riley compared the seven key principles about human learning set out by US cognitive scientist Daniel Willingham in his 2009 book, *Why Students Don't Like School?* with the 11 key principles identified in a 2012 NZCER report, "Supporting Future-Oriented Learning and Teaching – A New Zealand Perspective."[97]

Some of the 11 key principles NZCER set out accurately reflect the current consensus from cognitive science. They even reference Willingham's book. However, as Riley put it: "Many of the principles in the report conflate claims about what we know about learning (cognitive science) with arguments about what *values our education system ought to embrace*."[98] (Emphasis in original)

In particular, scientific findings are overlooked in New Zealand when they do not reinforce child-centred philosophy. For example, NZCER's 11 principles "we know about learning" are glaringly silent on three of Willingham's seven well-established principles from cognitive science. These are:

1. Factual knowledge must precede skill;
2. It is almost impossible to become proficient at a mental task without extended practice; and
3. Children are more alike than different in how they think and learn.

It is no coincidence that all three omitted principles relate to the parts of traditional schooling most opposed by child-centred philosophy: knowledge-based curricula and teacher-led pedagogy.

Riley highlights NZCER's claim that "learning has to be a personalised – not a standardised – experience," and that students must feel in charge of their own learning and its pace.

None of those claims tallies with current scientific understanding about cognition.[99] Neither 'feeling in charge' nor 'controlling the pace' are conditions for learning. Instead, there is copious evidence for the effectiveness of non-personalised and whole-class teaching.[100]

Soon after Riley's report was published, NZCER Chief Researcher Rosemary Hipkins published a response. In "Different Ways of Thinking About Learning," Hipkins discussed some of the challenges arising from NZCER's future-focused research.[101] She said Riley, and cognitive science, used a definition of learning that is 'insufficiently expansive.'

Defending NZCER's 2012 report, of which she was a co-author, Hipkins argued that its very purpose had been to take thinking *beyond* cognitive science.[102]

However, to go *beyond* cognitive science, the NZCER would first need to acknowledge *all* the discipline's principal findings and help the Ministry and teachers do so too.

BOX 5: What to do about difference

David Daniel and Daniel Willingham propose classifying characteristics accurately as:

- those that all students share and therefore science can help with;
- those that vary across students but are classifiable, in which case care is needed to identify which characteristics should be used to group students, and which should not; or
- those that are not classifiable and therefore should not be used to group students, but rather left to the individual judgment and professionalism of teachers to determine and accommodate.

Referring to the middle set of characteristics, Daniel and Willingham explain that while the idea of categorising students sounds distasteful, we might want to do it where it allows us to apply our experience. One example in New Zealand might be categorising students based on heritage or ethnicity. However, Daniel and Willingham caution that if students are to benefit, categories should be subject to the following three conditions:

1. The categories are meaningful, that is, children within categories are more similar than children in different categories;
2. We know which features to pay attention to so as to categorise kids successfully; and
3. The distinction drawn by the categories is educationally meaningful, that is, any plan to treat students differently based on the categories means everyone in each category learns better.

These conditions set a high bar.

Much of the emphasis in New Zealand research and teacher training is on adapting teaching (and the curriculum) according to difference. For example, most teachers receive training and development on culturally responsive pedagogy. This is understandable in a country where issues of educational inequity appear to be closely linked to ethnicity.

However, it is not clear that ethnic or cultural categories would always meet all of Daniel and Willingham's stringent conditions. Where there is robust evidence, for example, that treating Māori students in a classroom differently will aid their learning (and that of their peers), such evidence should be brought to the fore and referenced widely. However, it is far from clear that this evidence exists, or that we know

which features to monitor for grouping students meaningfully and successfully. Some Māori children likely have more in common with peers from other ethnicities than with other Māori children, and vice versa. It may not always be educationally advantageous to group students according to characteristics like ethnicity.

Yet, discourse, training and 'research' in New Zealand is predominantly focused on difference, with little regard for the costs of such an emphasis, let alone qualifying conditions.

Few educators would argue against Hipkins' assertion that responding to learners' differences is a "key role for the teacher." As Riley himself put it (quoting Daniel and Willingham), "students have individual differences that are both situational and preferential. And there is no doubt that effective teachers address these differences using their own experience as a guide."[103]

However, the degree to which teachers, let alone researchers, should focus on *differences* rather than *similarities* is less clear. That cognitive science (or any science for that matter) is based on generalities does not negate its insights. As Willingham and David Daniel explained in 2012:[104]

> Scientists and poets see the world differently. Scientists focus on predictability and order; they are therefore interested in how seemingly different entities are actually the same. Poets are more often interested in the individual, the unique … Both perspectives have value, but they highlight a challenge for educators: How are we to think about individuality among students?

Too much research and policy in New Zealand is written from the 'poet's' view, focusing on difference and individuality rather than scientific study (see Box 5).

In her 2014 response to Riley's cognitive-science based critique, NZCER's Hipkins argued:[105]

> Individual brain-based cognition is an inadequate frame of reference for how people learn in general, and therefore there will be limitations on how useful evidence of this type can be for determining how best to support learning for different young people in different contexts.

Yet, brain-based cognition (or rather 'generalisable theory about cognition') *is* a useful frame of reference for how humans learn in general. No cognitive scientist would ever argue that cognition tells the whole story (just as no doctor can definitively assert that eating steak every day eliminates iron deficiency). However, inherent human differences do not negate the value of models and science in improving health or learning. The existence of differences does not imply that education policy should ignore research about 'collective' human cognition.

Despite focusing for two decades on difference and flexibility, Hipkins continues to assert that "enabling learning conditions cannot be 'one size fits all'," and that focusing on "conditions in which cognition might occur, all other things being equal, is too restricting."[106]

She even positions scientific discoveries about human cognition at odds with equity:[107]

> All other things are not equal and a great deal is now known about why not – with associated suggestions about how to make learning more equitable… Sound traditional teaching will support some students but perhaps not others. Greater responsivity to the specific challenges faced by different learners is a key role for the teacher.

Few educators would disagree with this statement. Yet, it in no way negates the importance of teachers knowing the generalities about learning arising from cognitive science.

Teachers' default pedagogical approach should be broadly the same for all children of similar ages, with personalisation at the margin. Instead, official policy and research is preoccupied with activity at the margin. Much of it runs contrary to the most basic scientific findings, and the science of learning hardly sees the light of day.

What we know from cognitive science

Two discoveries from cognitive science with significant practical applicability to teaching are:

1. the distinction between working memory and long-term memory; and
2. that long-term memory plays a central role in cognition.

As the three educational psychologists Kirschner, Sweller and Clark explain:

> Our understanding of the role of long-term memory in human cognition has altered dramatically over the last few decades. It is no longer seen as a passive repository of discrete, isolated fragments of information that permit us to repeat what we have learned. Nor is it seen only as a component of human cognitive architecture that has merely peripheral influence on complex cognitive processes such as thinking and problem solving. Rather, long-term memory is now viewed as the central, dominant structure of human cognition. Everything we see, hear, and think about is critically dependent on and influenced by our long-term memory.[108]

The section below explores two basic examples of this phenomenon.

If presented with the following 18 numbers,

10584634 294 7352311

you would probably struggle to recall them in order, let alone conjure any meaning. However, presented with the following 18 letters,

Aotearoa New Zealand

you would probably be able to recall them perfectly and almost effortlessly. The latter task is much easier because our working memory benefits from having lots of relevant knowledge stored in our long-term memory. The words expressed by the combinations of letters (not to mention the letters themselves and the sounds they make) are already stored as chunks – words – in our long-term memory.

Thanks to all the knowledge stored in our long-term memory, when faced with those 18 letters our working memory is not overwhelmed. In fact, it could cope with many more words, read them within a longer passage, paragraph or sentence, and still leave room to think critically or creatively.

Knowledge stored in long-term memory also helps us solve maths problems.

Imagine calculating the final cost of a Warrant of Fitness ($60) plus GST (15%). There are various ways do this in your head. First, you might calculate 15% of 60, then add it to 60.

So long as you know that 10% and 5% make 15%, and that 5 is half of 10, to find 15% you might first find 10%, then halve it to find 5%, and then add the two totals. To find 10%, you might recall it is equal to a tenth, calculate it by moving the digits in

60 one place to the right (i.e. closer to the imaginary decimal point), leaving 6. Then to find 5% halve 6, leaving behind 3.

Finally, and if you have not forgotten the original question by now, you would add the 6, 3 and 60 to get 69. Oh, and don't forget to write the dollar symbol!

Calculating GST on $60 is an example of a straightforward maths problem we might expect school leavers to solve in their head. However, working through it also reminds us of how much background knowledge we rely on to solve problems without overloading our working memory.

Experiments in cognitive science have shown that working memory (i.e. the content of consciousness) has important characteristics. One is that information stored there does not stay for very long (i.e. fewer than 30 seconds). Another is that it has capacity to retain only very few new elements (between four and seven elements depending on a person's general intelligence).[109]

This small capacity makes working memory a constraint in processing a problem involving multiple pieces of information (like GST on $60, or our response to a new tax proposal, plastic bag ban or climate policy). However, the limited capacity of working memory applies only to new information. Once information is stored as an element in long-term memory, "there are no known limits to the amount of such information that can be brought into working memory from long-term memory."[110]

This simple finding explains much about what makes experts appear so skilful. Take the doctor who assesses a patient in a few minutes, correctly identifies their ailment, and suggests the optimal care. Or the rugby first five-eighth who, when faced with a line of defenders, knows exactly where to run and which opponents to distract in what sequence to maximise the chance of making the line.

Long-term memory's boon to working memory also explains why chess grandmasters can so quickly look at a chessboard and determine the best move. Chess grandmasters' working memories are similarly constrained as everyone else's. However, their hours and hours of practice give them the immense advantage of vast, long-term storehouses of knowledge of chess positions. Thus armed, and unlike most of the rest of us, these grandmasters' working memories can then concentrate on the minute or new details of the positions unencumbered by the need to simultaneously analyse the broader state of play.

In this way, even the skill of chess, which at first appears to rely on abstract analysis or problem-solving muscles, relies heavily on knowledge retained in long-term memory.

This link was discovered in the 1940s by Adriaan de Groot, a Dutch chess master and psychologist, and later improved in the 1970s by Herbert A. Simon and William G. Chase.[111] In both experiments, chess players of varying prowess were asked to look at a chess position for a few seconds and then reconstruct it from memory soon after. Both times, success was highly correlated with prowess. But when Simon and Chase repeated the experiment with random chess positions only, they found every player, regardless of prowess, performed equally poorly.

Hence, what made the grandmasters so much more effective in the first, orderly task was not an abstract mental skill of remembering the position of chess pieces. Rather, it was the vast banks of knowledge of typical clusters and arrangements of subsets of chess positions stored in their long-term memory.

The same principle applies to all fields. The general practitioner's skill in analysis and diagnosis derives from the thousands of facts committed to long-term memory and which together form 'schema' for understanding a patient's medical needs.

The electrician's skill derives from the thousands of bits of information learned through course work and practical application, woven together to create a capacity for complex problem-solving. The historian's ability to piece together and interpret the past derives from everything they already know, much of which others have discerned. Their skill in evaluating and critiquing a source comes from their knowledge of similar and different sources, the period, the narratives and the critiques that have come before.

School students do not need to form the complex schema required to work as doctors, electricians or historians. While these people are experts in these fields, most of us are relative novices. However, school leavers *do* need expert knowledge of certain schemas – e.g. for reading – and sufficiently broad knowledge to navigate the world and future choices.

By urging schools to jump to teaching the 'by-products' – competencies – of disciplinary learning, rather than accumulating the knowledge on which competencies rely, the NZC may well inhibit the very outcomes it aims to secure.

By encouraging child-centred, constructivist approaches, the NZC also limits pupils' chances to succeed. Young children really do develop before a parent's eyes. Babies and toddlers naturally acquire skills – from rolling to running, cooing to speaking – by exposure to their world.

As a result, it is tempting to extend nature's metaphors of unfurling and growth to the acquisition of information patterns like those needed for arithmetic and reading. But this is a grave mistake because there is nothing natural or innate about them.

Unlike walking and speaking, the information patterns involved in reading and arithmetic are not 'biologically primary.' Evolution

has not primed humans to develop these patterns naturally. Rather, the alphabet, the number system, the scientific method, etc. are all relatively modern inventions of society. They are what the evolutionary psychologist David Geary calls 'biologically secondary.'[112] Unless a person is explicitly taught them, and given plenty of opportunities to practice so that the new knowledge forms schema in their long-term memory, the skills will not develop.

Christodoulou explained this in the context of scientific discoveries:[113]

> The Greeks were taking baths for centuries before Archimedes worked out that an object that is wholly or partially immersed in a fluid is buoyed up by a force equal to the weight of the fluid displaced by the object. Once these breakthroughs are made, then we are all able to understand and use them, *if* they are explained to us. If they are not explained to us and we are left to discover them for ourselves, many people will simply never discover them, or will have very imperfect understandings of them. Even those pupils who do manage to learn through these methods will have taken a highly inefficient method that will have wasted a lot of time. [Emphasis in original]

And the reason for this is, once again, the limitations of working memory. Unless someone already has extensive background knowledge of a topic, their working memory quickly becomes confused. This is why lessons in which teachers break learning down into manageable chunks, sequence it coherently and provide timely opportunities for practice can be so productive and motivating.

Even reading is not a generic competency

One competency that appears at first glance to be highly generic is reading. Once mastered, we might assume that reading can be

applied to any field. However, this view is unhelpful. Reading comprises two distinct processes: decoding and comprehending.

Decoding is indeed a generic skill. Thanks to our knowledge of letters, of blending and manipulating sounds and segmenting written words, we have advanced skills in decoding. As a result, if you and a friend each read the made-up word 'traphit,' you would be highly likely to express the same sounds. If an 'e' were added at the end, making 'traphite,' you would likely both amend your pronunciation similarly. This is because decoding English is a generic skill that can be applied to all letter combinations once the necessary phonic knowledge is mastered.

However, reading comprehension is not a generic skill. It cannot be mastered and applied equally successfully in every context. Instead, reading comprehension relies on background knowledge. There are many reasons for this.[114]

The first and most obvious is that we are more likely to understand what we read (or hear) when we know what the words mean. As Willingham explains, if a friend informed you that your daughter was dating a *yegg*, the chances are you would want to find out the meaning of *yegg* to determine your reaction.

Conceptual understanding of words is also essential. Take this passage from the website of the Scottish governing body for curling:[115]

> Team Muirhead continued to face the Team Fleming barrage in second half and began it being forced to a single point. As the seventh end began, Team Muirhead was going all out for the steal. Skip, Hannah Fleming, was faced with three stones, two of which were frozen at the front of the four-foot. Fleming narrowly overshot and gave up a steal of 1 in the seventh. The eighth end continued in a similar fashion with Fleming once again forced to draw for 1, but this time they converted.

Unless you have significant background knowledge of the sport of curling, words like point, end, steal, skip, frozen, converted and even stone – words whose meaning we might know very well in other contexts – suddenly elicit little sense.

Another reason knowledge is essential to comprehension is that most writing and speaking contains gaps. Take the sentence, "I'm sofa-surfing, so I am finding it hard to open a bank account." A fuller version of this sentence might read:

> **I'm sofa-surfing**. *This means I have no permanent address. To open a bank account, you must provide proof that you live at your address. Proofs of address usually refer to bills or other formal correspondences sent to you at your residence. However, sofa surfing means I have no permanent address to receive such correspondence*, **so I am finding it hard to open a bank account**.

However, in most contexts, neither a writer nor a speaker would include all this information. Instead, they would assume certain knowledge, such that if you lacked it you would be left confused.

Another reason knowledge is essential to comprehension is that it enables us to group what we read into parcels of information that free up space in working memory to make new links and inferences.

In one famous experiment, researchers Donna Recht and Lauren Leslie used a wooden model to test how well 12-year-olds could replicate a written passage of play from a baseball game.[116] Half the selected students were high ability readers and half were low ability, and both groups had children with both high and low knowledge of baseball.

One by one, the students were invited into a room to read the same story about a made-up passage of play in a baseball game and to use the model to re-enact it.

Here is one extract from the original passage: "The ball is returned to Claresen. He gets the sign and winds up, and throws a slider that Whitcomb hits between Manfred and Roberts for a hit."[117]

The experiment found that while reading ability had little impact on how well students understood the story, knowledge of baseball did. In fact, so long as the poor readers had a strong knowledge of baseball, they performed almost as well as their good reading, strong knowledge counterparts. They certainly scored much higher than the good readers who had a poor knowledge of baseball.

This and other similar experiments illustrate the limitations of treating reading comprehension as a generic skill. It also highlights the central function of domain-specific knowledge in determining understanding.

Of course, few of us need to be able to understand a baseball or curling match report – these are specialist areas we would only read about if we were especially invested or informed.

However, to have the reading skill of an interested generalist; to be able to read a newspaper and not become confused; to be able to make informed decisions about your and your family's future; to debate our response to matters of general public importance like Covid-19 or globalisation relies on having vast storehouses of knowledge.

Below is the opening passage of a book review, selected at random from *The New York Times* on 9 November, 2019. It is an example of writing addressed to general readers and is a passage we might expect school leavers would understand:

> She was an impoverished Jewish immigrant from Russia who had started working in a cigar factory at the age of 11; he was the scion of an old-money Episcopalian family who enjoyed

> a mansion on Madison Avenue and a weekend house with a bowling alley.
>
> When Rose Pastor married James Graham Phelps Stokes on the shores of Connecticut in 1905, the couple insisted on omitting the word "obey" from the ceremony. They became active members in the Socialist Party, lending their support to a labor movement under siege during a time of widening inequality.
>
> Rose's socialist commitments were seamlessly aligned with her life experience; Graham's were more surprising, but he took to them with the ardor of a convert.[118]

To understand a review like this does not take in-depth or specialist knowledge like that required for a medical or a curling match report. Instead, newspaper journalists and the authors of the types of books they review write for general readers. Yet, to understand this opening passage enough to keep reading still requires considerable knowledge.

Readers need to have an idea where Russia and Connecticut are. They would benefit from knowing that in some contexts, 'enjoying' means owning and that Madison Avenue is a notoriously expensive street in New York City. They need to know the meaning of words like impoverished and omit, of expressions like 'old-money' and the 'ardor of a convert.' They might get by with a shaky understanding of words like scion, or even Episcopalian. However, if unfamiliar with the traditional marriage vows or basic tenets of socialism, they will be quickly confused.

This is just one example from thousands in any daily newspaper. However, it demonstrates how news, books and the media are only accessible to people who have general knowledge drawn from subjects as different as geography, literature, art and history.

As the American curriculum thinker and academic E.D. Hirsch, Jr. said about a similar example:[119]

> We may infer from this example that only a person with broad general knowledge is capable of reading with understanding the *New York Times* and other such newspapers. This fact has momentous implications for education, and for democracy as well. A universal ability of citizens to read newspapers or their equivalent with understanding is the essence of democracy.

Cognitive science and the NZC

Unfortunately for New Zealand, the assumptions that underpin the NZC do not accord with the findings of cognitive science outlined above.

According to the NZC, "The development of the competencies is both an end in itself (a goal) and the means by which other ends are achieved."[120] However, as this chapter has described, cognitive science explains why, for novices, the reverse is true – knowledge is both an end in itself and the means to competencies.

Clearly, once someone is sufficiently expert in a discipline, competencies become the *means* by which to gain more knowledge independently: the tables of how they learn turn. However, to talk, as the NZC does, about school children as though they are experts is deceptive. Despite what child-centred orthodoxy suggests, for the most part school children are novices. Talking about their learning needs as if they are already experts only diminishes their chances to succeed.

This back-to-front strategy is also promoted by the OECD's Director of Education, Andreas Schleicher. In a 2010 article on the case for 21st-century learning, Schleicher criticised schools that broke down learning and taught children the basics.[121]

> For most of the last century, the widespread belief among policymakers was that you had to get the basics right in education before you could turn to broader skills. It's as though schools needed to be boring and dominated by rote learning before deeper, more invigorating learning could flourish.

He also described how children in schools ought to do the same things as expert innovators and problem-solvers in businesses and universities:

> Conventionally, our approach to problems was to break them down into manageable bits and pieces, confined to narrow disciplines, and then to teach students the techniques to solve them. Today, however, knowledge advances by synthesizing these disparate bits …[122]

He even used a postgraduate level example:

> The Nobel Prize for Physics was awarded in 2010, for instance, to two UK scientists for their discovery of graphene, a new material with groundbreaking properties and potential applications. Known for their playful approach to physics, the two researchers' breakthrough came from a 2004 experiment involving a block of carbon and some scotch tape.[123]

Yet, nothing in his account of the two physicists indicates that they learned physics in a cross-disciplinary or 'playful' way before they graduated from school. Despite this, Schleicher advises breaking down subject silos, as might be appropriate for academics working in universities:

> If we spend our whole lives in the silo of a single discipline, we cannot develop the imaginative skills to connect the dots or to anticipate where the next invention, and probable source of economic value, will come from. Yet most countries,

> with the possible exception of the Nordic countries, provide few incentives for students to learn and teachers to teach across disciplines.[124]

Just like the NZC, Schleicher recommends schools use approaches best suited to experts, even though schools serve relative novices.

But what about meta-cognitive and comprehension strategies?

Having said all this about the knowledge-bound nature of competencies, it is important to acknowledge that meta-cognitive and comprehension *strategies* can be usefully taught.

Meta-cognitive strategies are useful maxims about how students ought to think. Small chunks of knowledge – things like "look out for confirmation bias" or "consider both sides of an issue" – can help students improve how they think.

The same goes for some reading comprehension strategies. There is a vast and convincing literature on the value of teaching specific reading comprehension strategies, for example, summarising and generating questions. Comprehension strategies are even described in detail on the MoE's Te Kete Ipurangi (TKI) website under Teaching Literacy.[125]

However, in his paper on reading comprehension strategies for the American Federation of Teachers, Willingham explains how meta-analyses find that relatively short reading strategy programmes (of about six sessions) are no less productive than longer programmes that include as many as 50 sessions.[126] It seems these strategies can be learned quite quickly.

Usually, lots of practice is essential for skills development. However, based on his knowledge of cognitive science and reading

of the research, Willingham suggests the reason students gain no more from the lengthy practice of comprehension strategies is that they are *not* skills. Instead, these strategies are more like tricks that are easy to learn and use, and the only difficulty is consistently remembering to do so. In this way, Willingham likens reading comprehension strategies to checking one's work in maths. "There is not a lot to learn in checking your work; it's not a skill that requires practice. But you do have to remember to do it."[127]

In summary, reputable research finds that subject to conditions (such as the ability to decode fluently), there is value in teaching metacognitive and comprehension strategies. However, they should not take up much teaching time.

Cognitive science and equity

To understand a text, a reader needs to know the meaning of upwards of 95% of the words in it.[128] This is why, when reading and talking to children, adults tend to select their words carefully.

However, like Tama and Lily in the introduction, children do not start school equally well endowed with words and knowledge. Instead, the size of their vocabulary tends to vary with the amount and quality of language they encounter at home.

One famous study, published in 1995, explored how socioeconomic background affected the number of words addressed to a child by the time they reached school. Researchers Betty Hart and Todd Risley counted the rate of words per hour spoken in the homes of professional families, working-class families and families on public assistance. They extrapolated that by the age of four, children of professional families have 30 million more words addressed to them than the least advantaged children. This finding is referred to as the "30 million word gap."[129]

Other studies have identified a link between children's socioeconomic and ethnic backgrounds and their vocabulary size. For example, one US study by George Farkas and Kurt Beron (2004) found that by age five, Black children were between one and two years behind White children in their vocabulary score.[130] Of course, variations exist within income levels and ethnic groups, but on average, young children's vocabulary sizes differ dramatically depending on their socioeconomic backgrounds. One critical effect of this is that by the time children start school, their storehouses of knowledge differ, too.

When you know a little about a topic, reading more about it helps add more knowledge and detail; it makes it easier to gain yet more knowledge. The flip side is that if you lack sufficient knowledge to understand in the first place, reading is less likely to help you accumulate more knowledge. It is also likely to be demotivating.

This phenomenon – whereby it is easier for those with knowledge to gain yet more – is known as the Matthew Effect after this line in The Gospel of Matthew:

> For everyone who has will be given more, and he will have an abundance. But the one who does not have, even what he has will be taken away.

The Matthew Effect explains why knowledge taught to young children creates a virtuous cycle and, equally, why children who know less when school begins so often never catch up.

The Matthew Effect goes to the heart of the struggle to improve the literacy levels of children from less well-educated families. It has profound implications for what teachers should teach from the start of primary school. Unless teachers are trained to understand comprehension and the knowledge gap; unless they make closing it a concerted focus; unless national curriculum

policy supports them to do this, the gaps that inevitably exists between new school entrants rarely do anything but grow.

Curriculum policy must encourage and support teachers to address the knowledge gap from the moment children start school. Anything less ignores what we know about how literacy develops. It ignores the route to addressing inequity.

If we care about educational equity, and about giving every child the chance to thrive in school and life regardless of where they come from, the Matthew Effect's simple insight has profound implications for what and how all schools, particularly primary schools, must teach.

Conclusion

Teaching is both a science and an art. While there are things teachers can and should learn about how all human brains learn, they must never be asked to treat children like widgets on a line. There must always be room to personalise teaching and treat pupils individually.

The personalising imperative comes through clearly in the NZC. It is also reflected in NCEA's unique design and wider resistance to standardised testing.

The personalising imperative was also demonstrated starkly in the 2014 discussion between Axford Fellow Benjamin Riley and NZCER's Rosemary Hipkins.

It is clear from their exchange that while Riley thinks cognitive principles matter, Hipkins is dismissive. For her, "A focus on conditions in which cognition might occur, all other things being equal, is too restricting." She believes it mistaken to think that "rational thinking can somehow be bracketed off from our messy

bodies and lives," or that "cognitive gains" are adequate evidence of learning.[131]

Instead, Hipkins argues that the only way to realise a 'future-focused vision' will be to take a "more expansive view of what we mean by learning."[132]

However, to maximise their impact, teachers need to treat children as both individuals and members of a community that shares certain cognitive characteristics.

New Zealand academic and researcher Graham Nuthall said in 1999, "Teaching is an art that requires, for its most effective expression, a solid basis of understanding of the learning process."[133]

It is deeply concerning that the Ministry's go-to organisation for educational research is so focused on differences that it fails to share established cognitive principles.

In fact, if New Zealand parents and politicians understood just how far the established wisdom has moved away from the science of learning, they would be shocked. If they realised just how unfashionable knowledge transmission has been made, they would be bewildered. If they knew how out-of-sync the curriculum and assessments are with those in high-performing countries like Singapore, they would be dismayed.

That this country's position in the international rankings of students' performance has not fallen even more than it already has is testament to the many schools and teachers who ignore the NZC. It is testament to the conviction and courage of educators who refuse to bow to child-centred and 21st-century learning orthodoxy.

Cognitive science shows why leading with skills simply does not work. It shows why memory matters and why Google does not fundamentally change what children need.

The Matthew Effect explains much about the origins of educational inequity. It also shows the importance of beginning knowledge-based schooling as early as possible. Some five- and six-year-olds may be unable to read themselves about history, science, astronomy and art. Some may not choose to even if they could. However, if teachers use class time systematically and coherently to widen students' vocabularies and knowledge of the world, then the gap between children from language-rich and -poor homes could recede. Children from language-poor homes could make up what they have missed. They could acquire the knowledge of science, history and culture to comprehend more complex texts once their decoding skills catch up.

If New Zealand really cares about educational equity, it cannot afford to keep ignoring the findings of science. It must end its child-centred fixation with '21st-century' skills and excessive flexibility.

CHAPTER 4

Where to from here

> *If any one asks, as so many are asking: "What is the use of my son learning all about ancient Athens and remote China and medieval guilds and monasteries, and all sorts of dead or distant things, when he is going to be a superior scientific plumber in Pimlico?" the answer is obvious enough. "The use of it is that he may have some power of comparison, which will not only prevent him from supposing that Pimlico covers the whole planet, but also enable him, while doing full credit to the beauties and virtues of Pimlico, to point out that, here and there, as revealed by alternative experiments, even Pimlico may conceal somewhere a defect."*
> — G.K. Chesterton, *All is Grist: A Book of Essays* (1931)

By all reliable metrics, child-centred schooling fails children, with particularly dire consequences for those most reliant on their schools to teach them the knowledge needed in life.

So why does the education establishment still advocate child-centred orthodoxy despite evidence to the contrary from cognitive science, empirical evaluation and New Zealand's long-term decline in international surveys?

The answer lies in several factors that have coincided to ensure the abject failure of accountability.

These factors include group-think and a lack of diverse perspectives within the education community – a situation exacerbated by the uniquely privileged position of the NZCER. They also include

efforts to change the purpose of school, often to transform society in line with a particular political ideology.

In particular, the purpose of school has been modified by efforts to achieve economic and employment aims, improve equity, 'give effect to the Treaty,' and improve student wellbeing. This chapter unpacks these compounding influences and explores how to create the change New Zealand needs.

The failure of accountability

Child-centred education, by its very definition, defies measurement and accountability. By focusing endlessly on the differences between students and overlooking similarities, child-centred education denies there is a common core of learning all children need. By denying that schools can or should be held accountable for securing even the most basic core of knowledge and skills, child-centred orthodoxy has subtly but profoundly changed perceptions of the purpose of school. In New Zealand, this change has even led to the removal of all mandatory standardised assessments in primary and secondary schools.[134]

In almost every field of human endeavour – from manufacturing to medicine and from science to sport – accurate measurement is a precursor to progress.

Take medicine, for example. In the early days, a hand on a patient's forehead was used to assess body temperature. Gradually, iterations of the thermometer improved assessment accuracy; nowadays, anyone can quickly and cheaply measure their own body temperature to a fraction of a degree. Advances in measurement led to improvements in diagnosis, treatment and recovery. The same principle applies in other areas too – from carpentry to carbon capture, chemotherapy to cartography.

Yet, frustratingly, the outcomes schools achieve for pupils appear to have changed relatively little, or in the case of New Zealand's PISA outcomes, even negatively.

When almost every other area of life is advancing, why does the school system still fail to equip so many pupils with the most basic capabilities? Variously, child-centrists put it down to old-fashioned 'factory-model schooling,' lack of relevance in the curriculum, over-emphasis on rote learning, etc.[135]

However, the real answer lies in New Zealand's failure to generate reliable education data and learn from it.

In fact, without the stark evidence of decline provided by international organisations like the OECD, readers might still be unaware of the categorical failure of New Zealand's child-centred approach – which is poised to prevail over future generations indefinitely. For example, the NCEA – which is the closest New Zealand has to a standardised assessment – does not indicate anything meaningful about the most basic trends in what students have achieved (see Figure 6).[136]

The arguments against standardised assessments of pupils' performance (like those conducted through PISA) are longstanding and well rehearsed. Teachers' unions in many countries, including New Zealand, strongly advocate many of the arguments.

Unions rightly exist to advance the interests of their members by pushing for better pay, benefits and working conditions. They also try to ensure fairness around accountability, which can be near impossible to allocate and is often measured inappropriately, especially in education.

For example, if Lily fails to make progress in Miss Heath's maths class, is it Lily's fault or her teacher's? Is it the fault of her tutor

who fails to follow up her poor attendance, or her head-of-year who has 'pastoral responsibility'? Despite her lack of progress in maths, if Lily became a compassionate or contributing individual thanks to working with Miss Heath, can this outcome be reflected in the measures used for accountability?

For reasons like these, teachers' unions have long resisted more accountability in education. In fact, the Primary teachers' union, the New Zealand Educational Institute (NZEI), successfully campaigned in 2018 to remove National Standards (see Box 6).

However, in some countries, compromises have been achieved to satisfy the needs of students and the system, while mitigating teachers' legitimate fears. For example, in England, all children take a short phonic knowledge screening test at the end of Year 1 when they are typically aged six. Despite being branded everything from unnecessary to immoral by teacher unions at the time, the test has become widely accepted. Between its introduction in 2012 and 2019, the percentage of Year 1 students passing it increased from 58% to 82%.[137] That means almost an additional 25% of students achieved the basic knowledge of phonics needed for reading fluency.

Much of the improvement occurred because the tests provided a strong incentive to focus teaching on what would be tested. However, the test also highlighted the schools that outperformed expectations. These schools then became meccas for teachers to visit and learn from. In this way, some schools that appear unassuming from the outside, and/or serve some of England's most disadvantaged communities, have become so inundated with visitors that they now package visits and sell them as professional development to their peers.

Of course, there is more to reading, let alone schooling, than passing a phonics screening test. Schools must also develop

students' vocabulary and knowledge, self-management and even their social skills and musical ears. Placing overly high stakes on a Year 1 student's phonics knowledge might unduly diminish some of these non-measured outcomes.

However, the phonics knowledge needed for reading is such a fundamental building block of all schooling that it is reasonable to assess it and hold schools accountable.[138] After all, how will a child access science, geography or music if they are unable to read? What use are thinking skills without the ability to articulate thoughts, or speak and write them fluently? Although sociability and musicality matter, these are secondary objectives of schooling. We sell children short when we buy the argument that an inability to measure outputs means allowing schools to dodge basic accountability.

Yet, all manner of arguments are used to discredit standardised testing in schools.

For example, it is argued that mandatory testing is cruel and unfair, especially to young children. However, results need never be shared. In fact, in many instances, children need not even know they are being tested. This is certainly many pupils' experience of phonics screening in England.

Fairness is a question of how tests are designed and administered, and what fairness means. In any case, schooling would be much fairer if the results of mandatory standardised tests helped all children secure the timely intervention they needed to learn to read. Schools' contributions must also be recognised via baseline and subsequent tests shedding light on the progress pupils achieve.

BOX 6: National Standards

Through the coordinated efforts of the NZEI and others, National Standards in reading, writing and mathematics were scrapped by the Labour-led Government in 2018. In making its case, the NZEI argued:

> [The New Zealand Curriculum] nurtures individual talents, cultivates creativity, celebrates diversity, inspires curiosity, and acknowledges the importance of a student's personal learning journey. All these are basic building blocks for life-long learning. In contrast the National Standards policy encourages more standardisation by treating learning as linear and age-related, rather than recognising the variations in students' learning.[139]

This argument is dishonest because it rests on a false dichotomy. Schooling should never be *either* creative or standardised. It should never focus exclusively on individuals *or* the collective. Instead, schooling can and must do both. It must recognise and nurture difference, while ensuring every child masters some basic knowledge and skills.

A national commitment to ensuring children are properly literate and numerate is not a narrowing or 'standardisation.' Instead, it is a condition of ensuring all children can access a rounded curriculum and leave school with the skills they will need in life.

National Standards likely drove some schools to change their focus. However, if those schools had previously failed to develop children's mastery of core areas, the adjustments to teaching and learning may well have been needed.

There can be few more powerful predictors of poor life outcomes and wellbeing than to leave school unable to read.[140] Research carried out in New Zealand with a small sample of prisoners showed that 90% lacked basic literacy and numeracy skills.[141] Yet, National Standards' focus on these essential skills was criticised outright as 'standardising.'[142]

Any school that unduly standardises its provision to improve test scores deserves to be criticised. Schools have a responsibility to be more than literacy and numeracy factories. However, the solution to this tension lies in the interpretation of 'undue' standardising. NZEI's argument that all standardising is detrimental is misleading.

Furthermore, well-designed assessments, particularly in reading, can actively promote broad curriculum provision that builds knowledge and vocabulary. For example, if teachers and students do not know in advance the subject of a reading comprehension test, and instead only know it could cover material from science and art, music and history, the incentive is merely to teach broad knowledge as effectively as possible.

Unions have often argued that nationally standardised tests are unnecessary because teachers can themselves observe and assess.[143] Teachers indeed do this to inform their planning and teaching. However, without nationally administered tests, teachers cannot know how their pupils are performing compared to their peers nationwide. To this, some argue that such wide comparison is unnecessary, that teachers can simply compare against set standards or other children they have encountered.[144]

However, it is precisely this failure to ensure every school regularly and transparently compares the performance of its pupils against their peers nationally that veils and permits injustice. It also perpetuates inequity by concealing the connection between lower socioeconomic backgrounds and lower outcomes – and the identity of the schools that have overcome the challenges lower socioeconomic backgrounds create for student achievement.

Just because a student tops her class in a rural school in Northland does not mean she would do so in a class in Epsom or Karori. Unless teachers (and parents) have concrete and regular reminders – in the form of reliable, standardised national assessment results – of this structural inequity, large expectation and outcome gaps will persist in New Zealand.

Educators, politicians and the Ministry of Education also fear standardised assessments will lead to league tables, which rank schools mercilessly (and often invalidly). Once comparative data

exists, no one can stop it from getting into the hands of the media, which inevitably creates its own league tables that discount the vast differences in schools' intakes and circumstances.

In response to this threat, New Zealand has removed mandatory standardised national assessments altogether. However, in most other countries the education authorities have found more effective compromises that account for the effects of students' home backgrounds, or their prior performance before entering the school. These contextualised value-added or progress measures are more sophisticated calculations that eliminate much of the unfairness of league tables. The New Zealand Initiative's own work in Statistics New Zealand's Integrated Data Infrastructure (IDI) has repeatedly shown just how sophisticated such calculations can be.[145] However, despite having more than 3000 staff to draw on, the Ministry so far has not used this data to identify over- and underperforming schools.[146] The same is true of ERO.

The final argument against testing is that it cannot measure what we truly value. This is true to a great extent. Educational assessment can only provide information on proxies for what we value – perhaps some combination of wisdom, knowledge, character and wellbeing, both now and far into the future. Education is easily subverted by attempts to reduce it to easily measured components, and then to measure those.

For narrow metrics to become the only concerns of teachers would be detrimental. However, given the importance of certain knowledge and skills, and of finding and sharing what works, some measurement *is* desirable. The question is what to measure and how, given the potential drawbacks and constraints.

A good education imparts proficiency in core areas alongside many other, more amorphous and desirable outcomes. And while it is near impossible to assess outcomes like wisdom, critical

thinking or wellbeing, abilities in reading, maths and science are measurable precursors.

Despite this, the NZCER's Cathy Wylie attacked conclusions based on PISA data as "very foolish" in an interview for *Stuff*.[147] Wylie reasoned that because achievements in the most basic areas are insufficient proxies for the aims of schooling, they should be disregarded outright.

However, if New Zealand is to overcome its steady slide into educational mediocrity, it must reconcile with some forms of standardised assessments in both primary and secondary schools. It must use the IDI to make fairer school comparisons and acknowledge the anti-measurement bias in key parts of its research community.

Group-think and lack of diverse perspectives

In a small country and within a specialist sector like schooling, the susceptibility to group-think is easily visible. Most of the grandees in university education departments, research organisations and the Ministry are former teachers who entered the profession in the idealistic 1960s and 1970s. For the most part, these doyens of child-centred teaching exist far away from real school classrooms, but their ideals still influence everything from teacher training to inspections, curricula and assessment regimes.

Recent years have made us aware of 'fake' facts and news. Perhaps even more dangerous is the problem of fake authority.

Fake authority describes individuals or organisations presenting themselves as *the* referees equipped with the independence and expertise to pronounce what is right, wrong and needed, not to mention what is happening. Fake authorities may even extend

to defining what information is circulated, what is open for discussion and what is off-limits.

The NZCER occupies a uniquely privileged position influencing educational discourse in New Zealand. A statutory body since 1945, the NZCER operates under an Act of Parliament and receives a sizeable government grant – Te Pae Tawhiti – from the Ministry of Education each year of about $1.4 million. Though this comprises around 13% of the NZCER's total operating revenue, the agency also carries out significant work (estimated at about a third of its other revenue) under contract to the MoE.[148] The implicit endorsement that flows from being the Ministry's go-to agency for research on all matters educational cannot be underestimated.

In its long-established and uniquely valuable position at the right hand of the Ministry, one might expect NZCER's work on curriculum and pedagogy to be meticulously evidence-based. Yet, as this report shows, in these areas the NZCER confuses evidence with values. It prefers transforming education through future-focused key competencies.[149] NZCER's abundant publications on key competencies – often commissioned by the Ministry – point less to scientific research and more to ideological commitment and the sunk-cost fallacy.[150]

The NZCER has repeatedly drawn on the 'Knowledge Age' literature to justify shifting the focus of schools from "reproducing existing knowledge" towards "equipping people to do things with knowledge, to use knowledge in inventive ways, in new contexts and combinations."[151] This way, it has not only miscategorised knowledge-based education as the mere reproduction of knowledge, but also overlooked what cognitive science says about the central role of knowledge in developing competency.

BOX 7: Three ways the NZCER defines educational discourse in New Zealand

1. Every three years, with costs covered by its annual grant from the Ministry, the NZCER designs and conducts surveys of principals, teachers and Boards of Trustees in New Zealand state schools. This has been done since 1989 for primary schools, and since 2003 for secondary schools.[152]

   According to the NZCER website, these national surveys have "become significant gauges of what is happening in our schools. They are important sources of information for the teaching profession, the Ministry of Education and other government agencies, and the public." However, it is the NZCER that decides the questions. In 2020, the survey was designed to reflect "new national emphases" on "wellbeing, and digital fluency," rather than address our continually declining literacy and numeracy rates.

2. According to an Official Information Act response, in the year to July 2020, the NZCER produced nine outputs from its Te Pae Tawhiti grant. Two were the national surveys of primary and secondary schools, one explored life paths of learners who have been tracked since early childhood, and one looked at literacy pedagogy. The remaining five projects were on games and gaming, integrating subjects in the curriculum, wellbeing (two reports) and education approaches to climate change. Through such outputs, the NZCER has been shaping discourse for many years.

3. Established in 2003 by the government with an annual budget of $1.5 million, the Teaching and Learning Research Initiative (TLRI) is a grant-making fund designed to improve educational outcomes by linking educational research to practice. The 159 TLRI projects to date have published more than 150 research reports and many more associated publications and presentations.[153] The fund is managed under a contract (worth half a million dollars in the year to July 2019) by the NZCER. This way, the NZCER helps decide what research is and is not funded in New Zealand.

Another example of group-think was in the 2019 report of the taskforce convened by the Minister of Education to review Tomorrow's Schools.[154] In its overview, the taskforce laid out three foundational assumptions about what is "critical to the success of Aotearoa New Zealand's future compulsory schooling system." One of these "essential points" was that the fix for lack of trust was an urgent system "reset" to a model that creates "much better connections between schools/kura, and between schools/kura and government agencies."[155]

Driven by the lack of national data or transparency, low trust is indeed a problem for the Ministry and schools. Yet, having assumed from the outset that the cure was a system reset, for 108 pages the Tomorrow's Schools taskforce hardly mentioned data.[156] Accepting the child-centred consensus against standardised assessment, the taskforce's solution to low trust was yet more bureaucratic involvement and brokerage.[157]

The Ministerial Advisory Group (MAG) convened to lead a review of the NCEA was similarly characterised by group-think and failure to reflect the views of some of the most popular and oldest New Zealand schools. Following the publication of the MAG's Discussion Document in May 2018, a coalition of 37 principals, schools and past principals published a full-page advert in the *Sunday Star Times* slamming the Minister for the failure of his advisory group to represent the secondary sector's views.[158] Ultimately, this forced the Minister to announce the creation of a new Professional Advisory Group (PAG). Comprising current and former principals and teachers, the PAG then worked alongside the MAG to provide expert advice on the NCEA review.[159] The PAG's involvement dramatically changed the resulting package of changes.

Group-think situations arise when a critical mass of people in a community have similar outlooks, biases or preferences. When this happens, dissenters become gradually quieter and less inclined

to point out when the emperor has ceased wearing clothes. In the case of the NCEA review, had it not been for the efforts of a few leading principals, the Minister would never have gathered a more representative set of views.

However, public service (as carried out by employees of the Ministry, Taskforces and, through their annual grant, the NZCER) is a privilege. This is not because working at a desk in Wellington is more pleasant than working in a modular classroom in Porirua, or because lunchtimes eating at a café are more relaxing than running detentions or photocopying. The true privilege comes from the opportunity to improve the educational outcomes of whole cohorts of children, and to make the work of frontline teaching colleagues more sustainable, productive and rewarding.

However, public servants' privilege comes with a duty – to lead schools in a direction based on *evidence*, to check that this is happening every step of the way and to change course when something fails or is disproved. To do this, public servants must resist politicians' incentives to create advisory groups whose members adhere to a particular philosophy (i.e. group-think by design). They must have the expertise and willingness to use quantitative and generalisable research approaches that rigorously test properly formulated hypotheses. Finally, they must have the courage to act on the findings.

Until the Ministry of Education can robustly demonstrate that child-centred education is optimal – that it raises excellence and improves equity – it needs to explore sound evidence-based alternatives and implement them.

When political objectives alter the purpose of school

Historically, the purpose of school was to pass on a culture's collective wisdom – the best that has been thought and said –

from one generation to the next. This way, children could stand on the shoulders of their forebears and benefit from the knowledge and wisdom they had gleaned. Inevitably, some students struggled to do this more than others. Their teachers had to work harder to keep them engaged, to adapt their teaching methods (pedagogy) to stop them falling by the wayside. However, the objective of schooling to transmit a body of knowledge that would enable future generations to function and thrive in society was never up for debate.

However, over the decades, other objectives have crept in, radically changing the goals of schooling in New Zealand. No longer built on knowledge transmission, schools now juggle many complementary and competing purposes.

Economic goals

For more than 30 years, reforms tried to reduce the hierarchy and disparity in esteem between 'academic' education and 'vocational' training. This is why the NCEA incorporates both types of learning under one qualification. It also explains the widespread idea that schools must provide students with 'pathways into employment.'

The gradual gearing of schooling towards meeting the needs of the economy is most often associated with right-of-centre governments, or 'neo-liberal' policy. However, in New Zealand it is broadly endorsed by both major parties. In February 2020, Labour Education Minister Chris Hipkins explained in a press release titled, "Vocational education to take centre stage in schools," how a series of new Ministry-funded trades-based events was part of a "concerted effort by this government to encourage more people to consider vocational education as a pathway into employment." In addition, the Government had unveiled

"a $12 billion infrastructure programme to build and upgrade roads, rail, schools and hospitals" so it was a "great time for young people to get into the trades."[160]

Few would deny the value of training in a trade, especially during these times of skills shortfalls in the economy. Children's education is nonetheless threatened by making pathways into employment a core purpose of schools. If preparing for work is a higher priority than the transmission of culture, teachers face pressure to put students into "pathways" too soon. Children have the rest of their lives to familiarise themselves with the world of work. However, without adequate safeguards in the national curriculum and assessment, children can encounter an education that is narrow and dehumanising.

For many, school represents the only opportunity they will ever encounter to transcend life's material needs – the beauty, complexity and passions that give meaning to human life. There is no reason a tradie should not also enjoy Russian literature or Māori art. There is no reason a young farmer who leaves school aged 16 should not find fascination in seismology or statistics.

It is surely everyone's birth right to be imparted the cultural understandings on which their civilisation is formed. It is impossible to know what will spark a child's interest either in school or later in life. Hopefully, we all still have passions that will pique in our futures. But only schools can offer every child the chance to peek at the truths behind the curtain of astronomy, archaeology, and transcendental maths. Only schools can make sure every boy or girl of all ethnicities has the chance to find belonging in Kapahaka, relatable characters in Shakespeare, or perfection in particle physics.

No matter how worthy other objectives may appear, they should remain secondary to the transmission of knowledge. They should remain happy by-products of schooling, not morph into its primary (or even equal) purpose.

Social goals

Equity

It is widely accepted the world over that the main challenge for education systems is to achieve excellence and equity.[161] Few people want to live in a country where only the elites have access to education excellence, or where poverty is destiny. To that extent, the social goal of equity is a well-established moral purpose of schooling policy.

However, little discussed is what equity means, or the trade-offs and imbalances inherent in attaining it. For example, if equity matters more than excellence, it can be easily raised by lowering the attainment of previously high achievers – by trading excellence in favour of equity.

International data suggests this has happened in New Zealand. According to PISA, between 2003 and 2018 the average reading scores of New Zealand's most socioeconomically disadvantaged quarter of students fell by 6 points, while those of the most socioeconomically advantaged quarter fell by almost four times that – 22 points.[162] On paper, this may appear like progress towards equity, but it has been achieved at the expense of attainment for all social groups, especially among the children of the well-off. Yet, not only have standards dropped, educational inequity is still worse here than in the UK, the US, Canada and Australia.[163]

Similarly, the charts in Appendix 1 show how, in all three assessed areas the proportion of New Zealand's 15-year-olds performing in the lowest categories has increased, and the proportion performing in the highest categories has fallen by an even larger percentage.[164]

Child-centred orthodoxy has created a race to the bottom. By failing to impose or uphold standards for all children, regardless of their differences, it has entrenched a link between

family background and what children are expected to achieve. Children like Lily are rendered uniquely vulnerable to the 'soft bigotry of low expectations.'[165]

The Treaty

Historically, the provision through state schooling of academic, knowledge-focused education for all was seen as a noble, egalitarian aim. However, in recent decades it is increasingly seen as elitist, or even a 'Western, hegemonic' imposition. Today, many educators simply do not see academic knowledge as relevant, especially for disadvantaged and Māori and Pasifika students.

When coupled with the longstanding on-average underachievement and low attendance of these groups, it is easy to see the appeal of a curriculum focused on what students find interesting. Faced with the complexity of selecting a canon of knowledge for a bicultural country, it is easy to see why policymakers were drawn to a curriculum that prioritised local decision-making. Mindful of the arguments surrounding Treaty entitlements, it is not hard to see why bureaucrats preferred flexibility to centrally prescribed knowledge from academic disciplines.

Since then, the *Education and Training Act 2020* has taken the Treaty a step further. Under the Act, the objectives of Boards of Trustees have been transformed so that, alongside educational achievement, they must now allocate equal priority to "giving effect to Te Tiriti o Waitangi." Schools must now ensure their local curriculum reflects local tikanga Māori and mātauranga Māori (Māori customs and knowledge).[166]

In a post-colonial country, the process and choices involved in defining a canon of 'the best that has been thought and said' are undoubtedly complex. For example, a curriculum that ignored Māori perspectives, narratives and knowledge would fail to embrace the full extent of this country's accumulated culture.

However, complexity is not an excuse for avoidance, and if schools are to now also reflect Māori customs and knowledge, then national policy must show them exactly what this means, then monitor outcomes for impact and accountability.

And despite what the NZC and the *Education and Training Act* suggest, not all knowledge is equal. Some types of knowledge help build more sophisticated and valuable schemas. It is these that should be taught in all New Zealand schools.

BOX 8: Powerful Knowledge: Curriculum lessons from post-apartheid South Africa

The term Powerful Knowledge was coined by British sociologist Michael F.D. Young. In his early work Young, like Freire, argued that knowledge oppressed children from disadvantaged backgrounds. He believed knowledge meant 'knowledge of the powerful' and that teaching it sustained inequity.[167]

However, as an advisor to the South African government, Young grappled with the complexities of creating a post-apartheid national curriculum and changed his position dramatically.

> It took the extreme circumstances of a country trying to find its way out of the rigid and racist system of apartheid for me to realise that something was wrong with the ideas if they persuaded teachers to dismiss the importance of knowledge as a basis for taking pupils beyond their experience.[168]

Instead of regarding knowledge as an oppression, Young's eventual position – known as Social Realism – acknowledges the possibility of objective knowledge (just so long as students also understand the social processes involved in constructing it).[169]

Happily, over the 15 years following the introduction of South Africa's first post-apartheid curriculum, and with input from Young, curriculum integration was dialled back, knowledge was re-specified and subject progressions reinstated. As the third curriculum review explained:

> What we have learnt is that, despite the good intentions of past efforts, an underspecified curriculum advantages those who are already advantaged – those who already have access to the knowledge needed to improve their life chances. What we need to provide is a clear statement of the 'powerful knowledge' … that provides better learning, life and opportunities for learners.[170]

After years of talking about educational inequity, and achieving no meaningful improvements, it is time the educational establishment in New Zealand acknowledged, like South Africa (see Box 8), that an "underspecified curriculum advantages those who are already advantaged."[171] It is time the NZC was reformed to place 'powerful knowledge' back at the centre.

Having converted from treating knowledge as an oppression to an emancipatory necessity, Young categorised it as separate from 'everyday knowledge' which, while useful as a pedagogic resource for teachers, is not what students come to school to learn.[172] Instead, knowledge is powerful "if it predicts, if it explains, if it enables you to envisage alternatives."[173]

In their 2014 book *Knowledge and the Future School*, Young, et al. suggest three criteria for defining powerful knowledge:[174]

1. It is distinct from the 'common sense' knowledge we acquire through everyday experience;
2. Its concepts are systematically related to each other in groups we call subjects or disciplines;
3. It has been developed by clearly distinguishable groups, usually occupations, with a clearly defined focus or field of enquiry. These groups include a range of experts from novelists and playwrights to nuclear physicists and marketing specialists.

It is debatable whether and which aspects of mātauranga Māori meet these three criteria. Regardless, the cultural inheritance of (at least some) Māori is a valuable part of the birth right of all New Zealanders. If this country is serious about transmitting knowledge, it would reform its national curriculum to be explicit about knowledge from Western disciplines and mātauranga Māori.

Wellbeing

According to the Tomorrow's Schools taskforce, student wellbeing is as important as academic achievement. For students to "feel that they belong and experience wellbeing," schools must focus on "learner/ākonga language, culture, and identity."[175] Intuitively this feels true. To recognise each child's language, culture and identity seems like the right thing.

However, as with all alternative purposes for education, goals like wellbeing may also involve trade-offs with other objectives. For example, if wellbeing matters most, teachers might downplay reading among children who struggle with it. This might boost their wellbeing temporarily, but it will cripple their chances of overcoming illiteracy indefinitely. Wellbeing is not served by avoiding difficulty but by cultivating perseverance in the face of it.

In one report, funded by Cambridge Assessment, Gabriel Heller-Sahlgren identified an achievement-wellbeing trade-off.[176] "Progressive educational theory has come to highlight the relationship between pupil-led learning, enjoyment, and performance as a virtuous circle… It would certainly be convenient if performance and happiness were self-reinforcing goals… Yet there is little rigorous research presented in favour of either the theory or the prescription." Instead, Sahlgren's report presented evidence that "effective learning is often not enjoyable… that several interventions and strategies – such as homework, school competition, and traditional teaching methods – involve an achievement- happiness trade-off."

Emancipation from ignorance has to be one of the best routes to achieving long-term wellbeing. Yet, the more New Zealand focuses on short-term wellbeing in curriculum decisions, the less likely this emancipation will occur. Schooling will become ever less about transmitting knowledge and ever more about emotional therapy.

Where to from here?

The child-centred myth on which the NZC rests is that teachers need near-total curriculum flexibility. Like many myths, this one contains a grain of truth: teachers do need flexibility over what and how they teach. They need time and space to adapt how they impart knowledge so students are motivated. They need room to develop the less definable aspects of education – the aesthetic, the critical and the creative. They also need room to use their subject knowledge and develop professionally.

However, to end the conversation there denies the costs of freedom, advantages of prescription and compromises.

When national curricula leave too much decision-making to teachers and students, they leave the door open to low expectations. They forfeit the opportunity to provide a safety net to all children. They create vast additional workloads for teachers. They undermine accountability.

A balance must be struck between competing needs.

Too much prescription leaves teachers unable to support their students to relate knowledge to their own experiences. Too little prescription risks undue focus on students' experiences to the detriment of emancipatory knowledge. Achievement objectives must be open enough for teachers to adapt to local contexts but specific enough to guarantee a child's birth right and enable some transparency.

As with every societal endeavour, the art of curriculum policy lies in balancing competing requirements – not an easy task. However, as this report shows, the NZC affords far more flexibility than is optimal. While the NZC might have felt liberating for some teachers, there is more to consider than just their autonomy. The NZC needs rebalancing.

Designing a coherent, knowledge-based curriculum is a complex and specialised task that requires deep subject knowledge and expertise. It cannot happen without a mandate, encouragement, support, challenge and capacity. Teachers get none of these from the Ministry.[177] In fact, in place of the evidence from cognitive science and international research, they get endless documents telling them why and how to teach "competencies."

Because of the NZC's flexibility, most teachers create their own curricula, lessons and materials. This is a prodigious waste of time that makes teachers' jobs many times harder than necessary. Reflecting this (as well as the design of the NCEA), the Post Primary Teachers' Association (PPTA) has repeatedly identified 'curriculum and assessment practices' as a leading cause of workload pressure.[178]

Even when curricula and lessons are excellent, all the time teachers spend on this work is time not spent deepening their own subject knowledge, developing questioning strategies, reviewing and giving feedback on students' work, or building relationships with students and families.

There are so many more productive things for teachers to do than plan from scratch *what* they are going to teach. Teachers do not need to decide whether to teach about the Himalayas, hemispheres, hippopotami or hot springs to maintain their professionalism. They do not need to decide whether to teach probability, pronouns, particles or Parihaka to exercise freedom.

They do not even need to create all their own PowerPoint presentations or worksheets.

Once a core curriculum of knowledge is prescribed, teachers still have to adapt lessons to their pupils. They still need to think about making their pedagogy culturally responsive.[179]

However, under present conditions, the space to think about, debate and discuss these crucial details is consumed by decisions about *what* to teach.

It is time New Zealand altered its curriculum and discourse to focus on knowledge from the subject disciplines. There are various ways to do this, and none needs to be highly prescriptive. A new curriculum need not determine every detail of every subject. It need not forget competencies. However, after years of neglecting subject knowledge, New Zealand does need a concerted effort to reinstate knowledge transmission as its primary objective – one through which other objectives can and should be achieved.

Conclusion

We all possess implicit biases and frameworks through which we make sense of the world and which constrain how we think. Multicultural New Zealand, with all its advantages and inequities, provides the perfect opportunity to interrogate these prejudices. However, we can ensure this happens in every school only if our national curriculum, assessment and accountability systems demand it.

For some activists, every piece of the curriculum must be viewed through the prism of race-based power. To them, no knowledge is politically neutral and there is no objective truth. For them, no modern canon could ever exist because New Zealand is not

a nation but a highly inequitable bicultural contest. In their eyes, knowledge is either Western, and a hegemonic imposition, or Māori, and enhancing of Māori identity.

Such conflicts defy resolution, but they are also unnecessary if we aspire to a liberal education. Based on each individual's sovereignty, liberalism achieves progress from past mistakes and injustices through argument and reason. It thrives on diverse perspectives.

A liberal, knowledge-based curriculum could be designed to reflect and respect the tensions inherent in modern New Zealand. The process of creating it would be both cathartic and constructive. It would help the nation progress towards maturity.

Once established, the New Zealand canon could then be widened or narrowed, updated and improved indefinitely. With the right accountabilities in place it could, finally, begin bridging the life-outcome gaps between ethnic groups that so perplex and embarrass this country.

Conclusion

He waka eke noa (We are all in this boat together)
— Māori proverb

At first glance, to argue against child-centred education is like taking aim at puppies or happiness. Of course, children should be at the centre of an education system. Of course, they should be the focus of schools.

However, as this report has shown, child-centred schooling in New Zealand means more than merely prioritising students' needs. In practice, it means children leading their own learning, and the system sidelining subject knowledge in favour of "competencies." Increasingly, it is also being used to justify alternative objectives like 'giving effect to Te Tiriti' and improving student wellbeing.[180]

Despite defying empirical evidence and the cognitive science of how humans learn, child-centred ideals are presented as fact in New Zealand. Furthermore, these ideals have become state-sponsored orthodoxy even though they hold children back and exacerbate inequity.

Yet, there are reasons – both from other countries and New Zealand – to hope that this orthodoxy can be overcome.

In England, over the past decade many of the changes to education policy have focused on improving outcomes for disadvantaged students through evidence-based policy. In particular:

- A new national curriculum reinstated the role and importance of subject knowledge as both the route to skills and the birth right of every child;
- Assessments were made more rigorous and demanding (despite the political risk of falling headline pass-rates);
- The reporting of outcomes was changed to encourage schools to keep more students studying a range of academic subjects – the English Baccalaureate (EBacc) – to the age of 16;[181]
- The provision of teacher training was diversified to include school-led schemes in addition to those led by university education departments;
- Through an endowment and partnership with a social mobility charity – the Sutton Trust – the UK government established The Education Endowment Foundation (EEF). The EEF uses randomised control trials (often regarded as the gold standard for educational research) to identify what can break the link between family income and educational achievement;[182]
- England's school inspector, OFSTED, changed its inspection framework so schools that fail to teach broad knowledge cannot be deemed as high achieving. OFSTED has also sought to champion evidence-based policy. For instance, in 2019 it published an overview of the research that had informed its new inspection framework.[183] When this invoked lively and healthy debate among teachers on Twitter and the blogosphere, the inspectorate engaged, including with its own blog, on how it had used cognitive load theory.[184]

Closer to home, in 2017, the New South Wales government's Centre for Education Statistics and Evaluation (CESE) published a report summarising the evidence base for much of the cognitive science explored in Chapter 2.[185] It then made recommendations for how teachers might accommodate its findings in their classrooms.

In 2020, the Australian government made a Year 1 phonics checking tool freely available throughout the country. The tool is

designed to help parents and teachers better understand a child's reading level and what extra support they may need to improve.

Since 2017, South Australia has been trialling a similar test.[186] Based on England's Phonics Screening test, the simple five- to seven-minute assessment is administered by classroom teachers to individual Year 1 students. South Australia made the test mandatory in August 2020.

New Zealand too has advocates for evidence-based curriculum and pedagogy. In 1994, Victoria University Professor Cedric Hall said: "Generic skills cannot be learned in isolation from a knowledge base or domain; each domain has its own forms and conventions which limit the direct transfer of generic skills from one context to another."[187]

In 1999, Graham Nuthall made the case for teachers understanding the human brain: "Teaching is an art that requires, for its most effective expression, a solid basis of understanding of the learning process."[188] His book, *The Hidden Lives of Learners*, was published by the NZCER in 2007.

In 2012, Victoria University's Bronwyn E. Wood and Mark Sheehan wrote "Dislodging Knowledge: The New Zealand Curriculum in the 21st Century." They concluded:[189]

> The uncritical acceptance of the ideas of 'change-makers' … is hardly surprising as the Ministry of Education New Zealand Curriculum Online site carries little critique of these thinkers and/or the assumptions upon which these ideas rest. Typically, these ideas are presented as an unchallenged orthodoxy.

Instead, Wood and Sheehan's aim was to draw attention to the "absence of knowledge" and to caution that such approaches "may fail to offer the conditions by which students may acquire the foundations for powerful, intellectual work."[190]

In 2018, The Education Hub in Auckland published an article by Efrat Furst, Harvard postdoctoral fellow and cognitive neuroscientist, on the role of knowledge in building understanding.[191]

Despite the child-centred upheavals of the 2000s, many schools in New Zealand still resist it actively. Some schools even encourage students to opt out of the NCEA altogether by offering alternatives – which bring with them knowledge-rich curricula – like Cambridge and the International Baccalaureate (IB).

Some academics also oppose child-centred orthodoxy. For example, Professor Elizabeth Rata leads the Knowledge and Education Research Unit (KERU) at The University of Auckland. In place of the localised and competency-based NZC, which confines children to learning what their teachers deem relevant, Rata advocates a curriculum that will bring New Zealanders together through shared knowledge, culture and understanding.

Alongside teachers and subject experts, KERU is working on the Knowledge-Rich School Project to create a knowledge-based curriculum for primary and secondary schools. Its two main principles are:[192]

1. Academic knowledge matters for individual children because it builds intelligence; and
2. A national curriculum is responsible for creating a shared pool of understanding so we can see ourselves as a unified society.

In 2019, the Ministry of Education's Evidence, Data and Knowledge team engaged with some of the complexity and insights from cognitive science in a report on the relative effectiveness of inquiry-based and teacher-directed instruction in science. Using OECD data, they explored this "highly polarised debate in the literature on teaching methods" and concluded:[193]

> To be effective, inquiry-based instruction relies on good school discipline, pre-teaching of key content, as well as adequate teacher guidance, teacher planning time and school materials … There is a generalisable "sweet spot" combining both methods, with teacher-directed methods in most to all classes and inquiry-based in some, with the inquiry-based instruction supplementary – e.g. as an end-of-module extension – to a general strategy of teacher-directed instruction.

Where so much of what is published in New Zealand blurs the boundaries between evidence and belief, this report was nuanced, well-referenced and practical. It is what educators should expect from their Ministry. This report was not hostile to reason, disconfirmation or disagreement, nor was it aimed at cajoling teachers into 'transformation' or pushing a particular set of beliefs. Instead, it treated teachers as professionals able to deal with complexity. To this extent, it marked a valuable step in moving away from visionary platitudes and towards analytic reality.

One policy that could profoundly advance (if appropriately reintroduced) evidence-based education is Partnership Schools – Kura Houroa. Partnership Schools were implemented by National Education Minister Hekia Parata as part of a confidence and supply agreement with the ACT Party. The first schools opened in 2014. Had Parata and the Ministry created the transparent assessment and accountability mechanism needed to monitor these innovative schools, the relative merits of different curricula and teaching methods would have been revealed. Some schools would have flourished while others would have been closed, ideally rapidly.

Unfortunately, individuals invested in the status quo recognised the threat posed by the heightened accountability measures that should have accompanied these schools. They recognised that if allowed to thrive, their outcomes (both good and bad) would challenge child-centred orthodoxy.

As a consequence, rather than evaluate schools through reliable quantitative metrics, the Ministry of Education commissioned qualitative reports by consultants. Devoid of meaningful data on pupil progress, these reports were worthless.[194]

With the opportunity for the schools to prove their worth to the whole system eliminated, a new Labour Government, influenced by teacher unions, killed the policy.

By contrast, in England, the equivalent Free Schools policy has survived and even thrived. After eight years, there are now 507 open Free Schools and 226 in the process of opening.[195] Compared to 20% of other school types, 30% of Free Schools are rated Outstanding by OFSTED. Free Schools' A level (end of school) results are also better, on average, than all other types of state schools.

Alongside Free Schools, many other state schools have left the control of their Local Authority to become Academies. Academy schools enjoy the same freedoms as Free Schools over budgets, term dates, employment decisions, etc. Many are part of families of schools – called Multi Academy Trusts – united by geography or an approach to the curriculum or pedagogy. By January 2020, 77% of England's state secondary schools and 35% of state primary schools were Free Schools or Academies.[196]

Academies are also subject to the same high levels of accountability as Free Schools. If one fails for a certain period, the Ministry intervenes and transfers its governance to a different Multi Academy Trust. Such a transfer was not an option when all state schools were managed by the monopoly provider – their Local Authority.

Failing schools are also more swiftly identified thanks to the scorecard of metrics used to measure school performance in

England. For primary schools, these include how much progress pupils at each school make in reading, writing and maths between the end of Years 2 and 6 compared to pupils across England with similar results at the end of Year 2. It also includes the proportion of pupils meeting the expected standard in reading, writing and maths, and the proportion achieving these at a higher standard. For secondary schools, the metrics include the proportion of students studying a core of five academic subjects to age 15–16, the proportion achieving passes in these core subjects, and the school's Progress 8 score, which rates how pupils' progress compares to peers across England with similar levels of attainment at the beginning of secondary school.[197]

By manifesting what is achievable – especially in some of England's poorest communities – Free Schools like Michaela Community School and Academies like Dixons Trinity have demonstrated the effectiveness of traditional education.[198] They have shown how rigorous, knowledge-based schooling can be transformational for disadvantaged children.

Frequently, traditional knowledge-based education is associated with the political right. By contrast, child-centred idealism is associated with the political left. However, anyone who cares about children whose earliest educational experiences are limited – children like Lily – will realise the failure of these categories.

There is nothing equitable about an educational approach so obsessed by difference and individuality that it fails to accept there is some knowledge all children need. There is nothing fair about a philosophy that tells schools to teach children like Lily and Tama different knowledge because of who their parents happen to be.

Yet, the child-centred reforms to assessment and the curriculum in the 2000s were implemented by Helen Clark's Labour Government. Then, apart from introducing National Standards,

and the short-lived experiment with Partnership Schools championed by ACT Party MP David Seymour, nothing was done to rewind the reforms during the following nine years of National Party leadership. Indeed, the appeal of child-centred orthodoxy has beguiled politicians from both major parties. By rejecting standard measures of educational performance, child-centred idealism has ensured that evidence eludes most policymakers and many parents.

This report denounces the NZC, which is both symptomatic and emblematic of child-centred orthodoxy. If New Zealand is to waken from its utopian, Rousseau-inspired slumber, the NZC must be rewritten from a much more scientific and knowledge-led basis.

However, this alone will not be enough to change the trajectory. Child-centred orthodoxy has reached much deeper than just the NZC. Ingrained in the collective psyche, its presumptions permeate everywhere from professional bodies and "expert" taskforces to the universities. Increasingly fortified by the fashionable language of wellbeing, belonging and emotional safety, child-centred idealism wields a moral weight few feel safe to object to publicly.

Faced with the damning findings of this report, New Zealand's educational establishment may simply dismiss it as an ideological critique of the "neoliberal" business community.

The same way the NZCER (and by association, the Ministry) approved of Gilbert's evidence-free provocations and championed them, it may disapprove of this report and ignore it along ideological lines. However, for the sake of New Zealand's future, we must hope that the educational establishment models intellectual curiosity and engages constructively with the scientific, generalisable evidence that has informed this report. After all, according to the description that accompanies the key competency "thinking" in the NZC, "intellectual curiosity is at the heart of this competency."[199]

Child-centred orthodoxy has rewritten the rule book of schooling in New Zealand. By replacing 'preparation for freedom in adulthood' with 'freedom now,' it overlooks that school children are relative novices. Instead of guiding them, child-centred orthodoxy says that if we treat children like experts this is what they will grow up to be.

It is a seductive idea. However, as a consequence of it, Year 13 history students are no longer expected to know the meaning of a commonplace word like "trivial." In maths, in 2018, average 15-year-olds performed the way 13.5-year-olds would have done just 18 years ago. Where New Zealand was world-leading, both its ranking and standards have plummeted.[200]

More disturbingly, because the NZC is content-neutral, children are no longer united by a common cultural inheritance passed on to them by their schools. In place of a national narrative, children are increasingly being divided according to ethnicity and what their teachers deem will most effectively keep them engaged. They are divided into those who know a lot because their school ignored official advice – or because they have parents who do for them what their school cannot or will not, and those who know very little because their school embraces the child-centred NZC. Children are being divided into the ever-more flourishing Tamas and ever-more floundering Lilys.

Changing the assumptions that underpin education policy will not be easy. Powerful forces will continue to pretend that all is well, or that the route to improvement lies in alternative focuses like anti-bullying and wellbeing.[201]

However, if parents, politicians and educators demand better evidence, and if the Ministry sources research objectively, New Zealand can regain its status for excellence – and in a way that finally narrows the yawning gap between Tama and Lily.

Recommendations

As this report has shown, New Zealand's educational problems stem from a detrimental philosophy. Reversing the damage and achieving progress will require a coordinated effort led by courageous politicians.

Effective change in education requires buy-in from the education community. Though currently granted little voice by the Ministry, there are still plenty of school leaders, teachers, union employees and parents who recognise the need for more science and evidence to moderate the influence of child-centred orthodoxy.

The following list of recommendations is comprehensive. Not all these policy levers need to be pulled concurrently. The phonics screening tool could be deployed for a fixed period, then reviewed. If the desired effect is achieved within that timeframe, it could be withdrawn. Other levers could be used for a longer period. The Government and MoE could use the optimal combination of levers at a certain time to achieve the most beneficial impact.

1. Create an evidence-based profession

Together with the profession, and experts in assessment, design a handful of standardised national assessments to highlight the most and least effective schools and approaches.

Completed periodically by all students in certain year groups, these assessments would provide valid, reliable and comparable information about the attainment and progress students achieve across core areas in every school. This data would empower

school leaders, teachers and trustees to collaborate to drive up standards organically. It would also better equip ERO and the Ministry to rapidly identify failures and intervene effectively.

Creating progress data (which requires pre- and post-assessments) is essential if schools are to be treated fairly. The use of the IDI to account for children's family background characteristics would help level the playing field.[202] It would also help identify the approaches that work best for different communities.

To minimise the production of league tables by the media, and undermine the value placed on them by the public, data must be collected and presented carefully. One way to limit the appeal of league tables would be to have, for example, Year 6 assessments for both science and social science, but each year allocate schools to complete one or other assessment randomly. This way, schools would be incentivised to cover the material in both areas, but the number of assessments completed would be halved and any league tables created incomplete.

Another way to minimise the value placed on league tables, and encourage stakeholders to engage with data more thoroughly, would be to provide a suite of summary statistics on student progress and performance. For example, summary statistics might cover the percentage of Year 6 students who achieved a certain level:

- in English (or te Reo);
- in maths;
- in both English (or te Reo) and maths;
- in all the three subjects above, but where the data is adjusted to reflect what these percentages would have been if the background characteristics of the students were average;
- the proportion of students who, across the six preceding years, achieved the expected amount of progress in each assessed area, individually and collectively;

- the proportion of students who, across the six preceding years, achieved a certain higher level of progress than expected in each assessed area, individually and collectively.

The Initiative's 2018 report *Spoiled by Choice: How NCEA hampers education, and what it needs to succeed* analysed and critiqued the NCEA. It then described the reforms needed to improve it. At least three of the seven recommendations in that report were reflected in the Minister's subsequent change package for the NCEA.[203] Others were overlooked. See the report for further analysis and detail.

2. Create a new national curriculum based on disciplinary knowledge, not competencies

In the short- and medium-term, any new curriculum would need to be reasonably prescriptive. This does not mean that teachers would have no freedom over the content they teach, but a core minimum would be prescribed nationally.

In time, once the essential role of knowledge – both as an end in itself and the means to competencies – had been re-established, it may be possible and desirable to reduce the level of prescription. Until then, a national curriculum that actively drives change will be an essential policy lever. It must specify the most powerful knowledge, and ensure children understand the means through which knowledge is created in each discipline.

Once compiled, the Ministry will need to ensure the new curriculum is effectively implemented. Various mechanisms exist to do support, including:

- **Assessing student knowledge.** As described above, not every subject needs to be assessed in each school

or year group every year. To do so would be incredibly burdensome, expensive and unnecessary. However, at present, the only nationally standardised assessment in primary schools is the National Monitoring Study of Student Achievement (NMSSA), which assesses national samples of students, and covers all eight learning areas in the NZC on a five-year cycle. The Ministry must replace the NMSSA with a solution that provides more timely information to individual schools.

- **Reforming ERO's inspection framework.** Schools must be deemed as succeeding only if they implement the new curriculum effectively and achieve certain accountability metrics.
- **Reforming guidelines and expectations for teacher training.** The Ministry must identify what new teachers are taught during their training, then alter the guidelines and standards such that all new teachers learn about the science of learning, the philosophical debates that exist in education and how to evaluate claims scientifically. Recommendations 1 and 2 will also improve the feedback loop that enables school leaders to hold training providers accountable for quality.

3. Encourage evidence-based instruction in early literacy

To move all schools to teach early reading effectively, the Ministry must deploy a combination of the following levers:

- Upskill existing teachers and change pre-service teacher education so all are trained in line with the overwhelming evidence about the best way for children to develop strong foundational literacy skills;
- Update instructional resources from the Ministry;
- Implement a phonics screening test in the short-

to medium-term, or at least until New Zealand's attainment in assessments like PIRLS improves significantly;
- Make available a series of decodable reading books that support phonic-based approaches to early literacy.

4. Reintroduce partnership schools, but with rigorous accountability

5. Redress the dominance of the NZCER

When the NZCER was made a statutory body in 1945, there were no education departments within universities. Hence, a research body was needed. Nowadays, most universities (and some private research organisations) have education faculties. The NZCER's statutory status and government grant are anti-competitive and ought to be removed.

6. Fund quantitative and generalisable research approaches that rigorously test properly formulated hypotheses about what might raise attainment and break the link between socioeconomic and ethnic backgrounds and educational achievement.

Further reading (and watching)

- E.D. Hirsch, Jr. *Why Knowledge Matters: Rescuing Our Children from Failed Educational Theories* (Harvard Education Press, 2016)
- Daisy Christodoulou, *Seven Myths About Education* (London: Routledge, 2014)
- Daniel T. Willingham, *Why Students Don't Like School? A Cognitive Scientist Answers Questions About How the Mind Works and What It Means for the Classroom* (Jossey-Bass, 2009)
- Natalie Wexler, *The Knowledge Gap: The Hidden Causes of America's Broken Education System – And How to Fix It* (Avery Publishing, 2019)
- James Chapman, Bill Tunmer and Alison Arrow, "Why are NZ's literacy results so appalling?" (Massey University, 8 December 2017)
- Elizabeth Rata, "NZ's knowledge blind spot" *Newsroom* (19 February 2019)
- Daniel T. Willingham, "Critical Thinking Why Is It So Hard to Teach?" *American Educator* (Summer 2007), 8–19.
- Barak Rosenshine, "Principles of Instruction: Research-based strategies that all teachers should know" *American Educator* (Spring 2012), 12–19.
- Global Education and Skills Forum, "Should we fill 21st Century learners heads with pure facts?" YouTube (30 March 2017)
- Robert Pondiscio, "The 57 most important words in Ed Reform" YouTube (16 December 2014)
- Daniel T. Willingham, "Teaching content is teaching reading" YouTube (9 January 2009)

Appendices

Appendix 1

Figures 7–9 show changes in PISA outcome over time. For example, in maths, the proportion of Kiwi 15-year-olds performing in the lowest category has increased from 15% to 22%, while the proportion performing in the highest category has dropped from 21% to just 12%.

Figure 7: The proportion of students at each proficiency level in maths since 2003

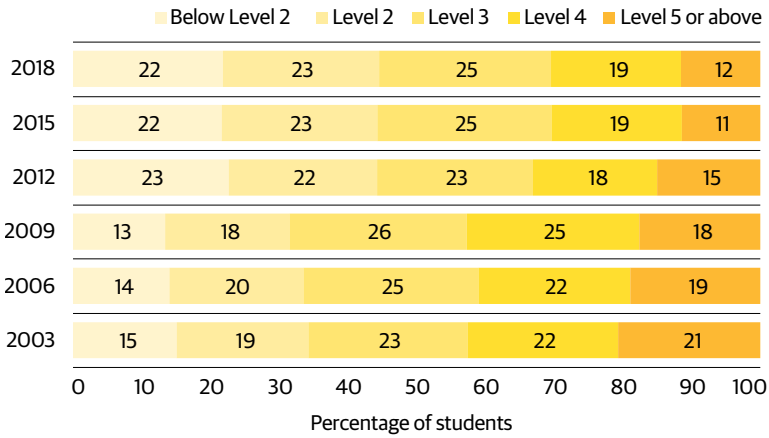


Figure 8: The proportion of students at each proficiency level in reading since 2000

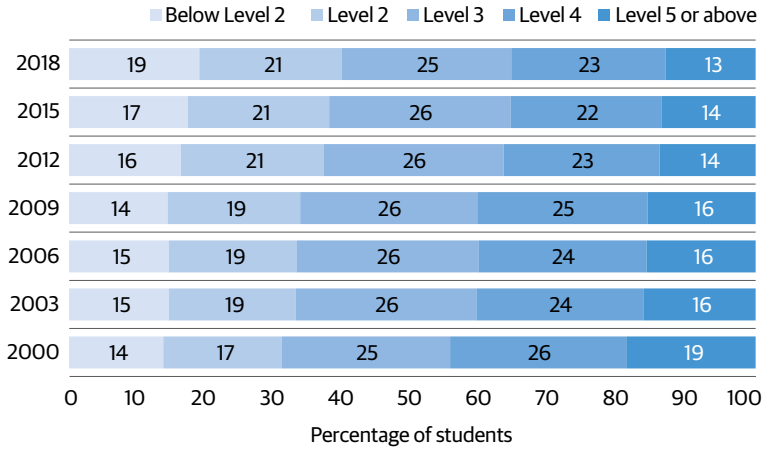
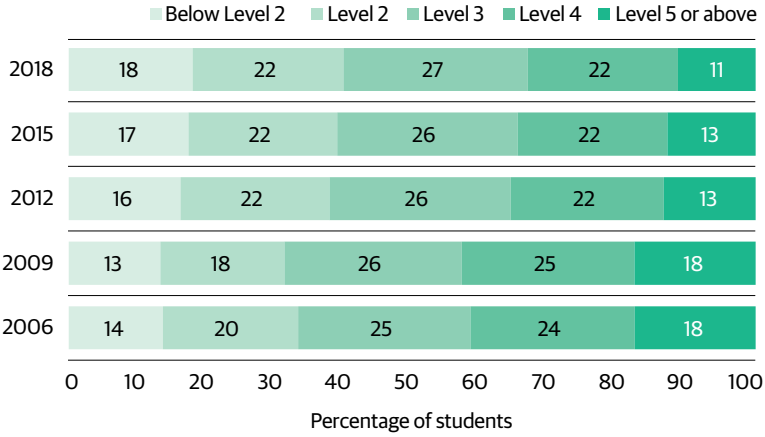


Figure 9: The proportion of students at each proficiency level in science since 2006



Source: Steve May with Adam Jang-Jones and Alexandra McGregor, "PISA 2018 New Zealand Summary Report – System Performance and Equity" (Wellington: Ministry of Education, 2019), Figures 2.4, 1.4 and 3.4.

Appendix 2

Much of education research today is driven by advocacy. To give a sense of NZCER's role in transforming schooling in New Zealand, Table 5 catalogues the projects the agency itself recently deemed relevant to understanding the evolution of key competencies since 2007. Compiled in a 2018 retrospective (commissioned by the MoE), the catalogue focuses on "larger, systemic studies, usually funded by the MoE." It also groups them into four time phases (see first column). Where available, the last column details who funded and completed the projects.

Of the 15 projects cited by the NZCER, 11 appear to have been funded either directly or indirectly by the MoE, while 12 were completed by or with input from the NZCER.

In addition, Table 6 lists 10 further articles, resources, reports and conference papers available on the NZCER website that include 'Key Competency(/ies)' in their title.

Table 5:

Phase	Project name	Publication date	Description	Who paid and who completed it
1. Learning about the nature of KCs	KCs in Normal Schools	2006	Six Normal Schools and several NZCER researchers collaborated to explore ways these schools might build KCs into the curriculum.	The project was partly funded by the Normal Schools and partly by the MOE. NZCER completed.
	KC case studies		Five case studies in early adopter schools were summarised in seven pamphlets that covered topics such as: the nature of KCs; how schools might develop their own approaches; and what the KCs might mean for curriculum, teaching, learning, and assessment.	MOE funded. These pamphlets are no longer in print so it is unclear who wrote them.
	Key Learning Competencies Across Place and Time	2008	An Initiative set in early childhood and in the first years of school which explored children's demonstrations of KCs, what teachers did to support their development, and how this was assessed and reported.	Funded by the Teaching and Learning Research Initiative (TLRI), a research fund made available by the MoE and managed under contract by NZCER. Completed by a team from the University of Waikato
	The nature of KCs	2006	A background paper commissioned by the MOE which unpacked each KC separately. A sociocultural framing was used to draw attention to the importance of pedagogy in opening up opportunities for students to develop their KCs.	MoE funded. Completed by the NZCER.
	KCs: Repackaging the old or creating the new?	2006	NZCER hosted this conference in April 2006. Alan Reid, an emeritus professor from South Australia, was the invited international keynote speaker. He introduced the idea of teaching through the learning areas for competency development, an idea that took some years to really take hold.	Funding unclear. NZCER hosted the conference.
	Documenting learning of KCs: What are the issues?	2005	This exploratory paper began to scope challenges for assessing KCs, by looking at assessment practice in other similar initiatives. Some broad approaches were recommended but it raised more questions than answers.	Published (so presumably funded) by the MoE. NZCER completed.
2. KCs and learning to learn	Monitoring and evaluating curriculum implementation (MECI)	2011	This research used surveys and focus groups "to establish a national picture of implementation progress in English-medium schools in the first two years following the curriculum's launch in November 2007". KCs were an important focus but the project was about all of NZC.	Funded by the MOE. Produced by Dr Claire Sinnema from The University of Auckland
	Curriculum Implementation Exploratory Studies (CIES)	2011	This research complemented MECI by taking a more in-depth look at implementation dynamics. The researchers documented practice in a range of case study schools, returning to these several times in two phases of research. Again, KCs were an important focus but the project was about all of NZC.	Funded by the MOE. Completed by NZCER and the University of Waikato
	Lifelong literacy	2010	This project explored ways of integrating a focus on KCs into reading programmes. Over an extended period of time, researchers worked with Years 3–6 teachers in five primary schools. All were nominated on the strength of their current practice in teaching reading.	Funded by the Cognition Institute. Completed by NZCER.

Table 5 cont.

Phase	Project name	Publication date	Description	Who paid and who completed it
3. Integrating KCs into learning areas	KCs and effective pedagogy	2014	This project explored ideas and practice for effective integration of KCs and content. Researchers and innovative teachers worked together to develop rich stories about the learning that can unfold from a purposeful weaving of both elements.	MOE-funded. Completed by NZCER and the University of Waikato.
	Science Capabilities	2014	The idea of science capabilities emerged from a programme of research (by NZCER) that involved three interrelated projects in science education. The researchers described an initial set of five science capabilities that all students would need to develop to become the critical, informed, responsible citizens envisaged by the science learning area statement and by the NZC vision.	Outputs hosted in MoE's TKI website, so presumably MoE funded, with reference to work by the NZCER Chief Researcher Rosemary Hipkins on 'Unlocking the idea of 'capabilities' in science', so presumably NZCER completed.
	International Capabilities	2014	This exploratory study considered the feasibility of measuring New Zealand senior secondary students' international capabilities. These were described as the international and intercultural expression of the KCs. They were seen to help elucidate what the KCs look like when they are applied in intercultural or international situations.	MoE funded. NZCER completed.
4. KCs and action competence	KCs for the future	2014	This project took the form of a future-focused inquiry into capabilities students might need to be "future-builders" rather than "future-copers".	Funded and completed by NZCER
	KCs in the National Monitoring Study of Student Achievement (NMSSA)		This research began near the end of the first cycle of NMSSA assessments. The ways in which different aspects of KCs and learning area content came together, allowing students to complete each task, were described. Capabilities that students would need to complete the tasks were identified (each one of these remixes aspects of the KCs).	Published by Educational Assessment Research Unit, University of Otago, and NZCER under contract to the MoE.
	Describing progress for students who remain longer term in one curric. level	Ongoing	This project is at a preliminary stage. In some early projects, KCs were essentially positioned as a substitute for reporting on academic learning gains for students with special learning needs. By contrast, this project is predicated in the belief that all students have a right to access all the learning areas of NZC, as they are able.	No such information currently available

Source: Sue McDowall and Rosemary Hipkins, "How the Key Competencies Evolved over Time: Insights from the Research" (Wellington: NZCER, 2018)

Table 6:

Project name	Publication date	Description	Who paid and who completed it
Thinking about the KCs in the light of the intention to foster lifelong learning	2005	This article overviews the background to the development of the key competencies, and looks at their connections with the previous essential skills framework.	Journal article in set, by NZCER's Rosemary Hipkins
Nature of the KCs	2006	This report provides background material on the KCs proposed for the New Zealand school curriculum.	Rosemary Hipkins, NZCER produced for the MoE.
KCs: Challenges for implementation in a national curriculum	2006	Conference paper presented at the KCs: Repackaging the old or creating the new?	Rosemary Hipkins, NZCER produced
What might it take to implement the KCs?: Some issues to consider.	2006	Conference presentation recorded from the Normal Schools Conference, 2006, exploring some of the theory underpinning the KCs, and possible implementation challenges.	Audio recording by NZCER's Rosemary Hipkins
Assessing KCs: Why would we? How could we?	2007	This article was included in an information pack for school principals and curriculum leaders, designed and distributed by the MoE and intended to support the implementation of the New Zealand Curriculum.	Rosemary Hipkins, NZCER produced
The "something more" in KCs	2008	This article explores how the KC thinking links with 21st century views of teaching and learning.	Journal article in set, by NZCER's Rosemary Hipkins
Determining meaning for KCs via assessment practices	2009	Key competencies can be interpreted within a relatively traditional skills-based framework, or they can be seen as a vehicle for transforming schooling to better meet students' learning needs for the 21st century.	Journal article in Assessment Matters by NZCER's Rosemary Hipkins

Table 6 cont.

Project name	Publication date	Description	Who paid and who completed it
More complex than skills: Rethinking the relationship between KCs and curriculum content	2010	The role that key competencies will play in a curriculum depends on how they are interpreted. The "skills" pathway could lead to modest improvements in teaching and learning. It is, however, unlikely to achieve longer-term goals such as strengthening citizenship, enhancing creativity and fostering lifelong learning. Such goals have future-focused and dispositional components. The "participatory" pathway could support these longer-term goals. Students are challenged to use knowledge, not just get it.	Conference paper by NZCER's Rosemary Hipkins
The recursive elaboration of KCs as agents of curriculum change	2011	This paper views key competencies through a sociocultural lens to discuss the role they have played as agents of change in The New Zealand Curriculum and their as yet unrealised potential to stimulate further change.	Journal article in Assessment Matters by Rosemary Hipkins and Sally Boyd
Remixing the KCs: A curriculum design deck	2017	"A professional learning resource for teachers to take a fresh look at the New Zealand Curriculum KCs. The resource consists of a set of sortable cards – much like playing cards but with a playful curriculum thinking purpose. …	

Source: NZCER "Key Competencies" Website (search accessed 18 September 2020)

It is clear from the size of this back-catalogue that the NZCER (often with MoE funding) has actively pursued key competencies to transform education in New Zealand.

Appendix 3 examines one example of NZCER's naivety about the NZC's capacity to develop competencies.

Appendix 3

Seven years after the launch of the NZC, four NZCER researchers (Rosemary Hipkins, Rachel Bolstad, Sally Boyd and Sue McDowall) published *Key Competencies for the Future* (2014). Aimed at helping teachers achieve NZC's original transforming vision, the authors acknowledged the curriculum's potential naivety in the first chapter:

> NZC's vision sets out an idealistic account of "what we want for our young people" (p.8) … These attributes are such self-evidently good things that it would be hard to find dissenters. But what does all this rhetoric actually mean where the rubber hits the road – that is in the classroom, during day-to-day teaching and learning? That's a much trickier question.

This acknowledgement of the NZC's naivety and failure to deliver was overdue and welcome. Even so, the book did little to re-establish disciplinary knowledge in developing competencies.

In one language-based illustration, Hipkins, et al. said "some useful and interesting signals at the overview level of the curriculum" make the NZC's vision "much more expansive than simply being able to speak another language when relevant." To substantiate this assertion, they quote the following passage from the learning languages overview:[204]

> As they learn a language, students develop their understanding of the power of languages. They discover new ways of learning, new ways of knowing, *and more about their own capabilities*. Learning a language provides students with the cognitive tools and strategies to increase their understanding of their language(s) and cultures(s). [Emphasis in original]

This sounds heartening. Most parents would prefer their children achieved the latter than the ability to merely "speak another language when relevant." However, what neither the authors nor the NZC explain is:

a. The evidence that students who learned a language prior to the NZC did not also acquire these more abstract competencies – one suspects many language teachers and students would have disagreed; and
b. Why a combination of 'more expansive,' high-level descriptors and complete curriculum flexibility would somehow lead to dramatic improvements in students' competencies without also damaging basic language proficiency.

Appendix 4

In 2010, NZCER Chief Researcher Rosemary Hipkins described the inevitability of a conflict between teaching content and competencies in a speech delivered in Seoul.[205]

> Teachers cannot provide the sorts of learning experiences described above while continuing to "cover" a large body of curriculum content. Even though NZC gives them the mandate to make a selection of content most relevant to the needs of their own students, many schools and teachers will continue to feel uncomfortable about doing this, especially if they see efficient and clear content coverage as a hallmark of good teaching and hence as their main responsibility to students, parents and the system that employs them. Messages teachers get back from school leaders, assessment systems (e.g. school-exit assessments for qualifications), students and parents can all reinforce a traditional view of their role. Thus understanding the difference that key competencies are intended to make is everyone's business.

Despite explicit caveats to the contrary since at least 2012, two years earlier the NZCER's Hipkins believed and promoted the idea that NZC's competency focus must diminish 'content coverage.'[206]

Endnotes

1. Of course, young children learn all kinds of things independently – how to walk, read facial expressions, be dexterous, speak, etc. However, these skills are what the evolutionary psychologist David Geary terms biologically primary, in that humans have evolved to be able to do them. To be successful in today's societies, adults need biologically secondary skills, like the ability to read, do maths, etc. The gap between what children learn effortlessly and what adults need to thrive in modern societies has widened over time – hence, the creation of schools to close the gap. David Geary, "Principles of Evolutionary Educational Psychology," *Learning and Individual Differences* 12 (2013), 317–345.
2. Daisy Christodoulou, *Seven Myths About Education* (London: Routledge, 2014).ghjghof 5 or 6 for considerationabout Education d not matter which) leaders with successful school t of 5 or 6 for considerationghjghof 5 or 6 for considerationabout Education d not matter which) leaders with successful school t of 5 or 6 for consideration
3. OFSTED is England's equivalent of the Education Review Office (ERO).
4. John Dewey, *Experience and Education* (New York: Macmillan, 1938).
5. Famous research by Betty Hart and Todd Risley found that by age four, the average child from a professional family has had 30 million more words addressed to them than those from the least advantaged homes. That is the difference between four-year-old Tama using words like "hibernate" and "thermometer," and Lily, who is of the same age but has never heard those words. Betty Hart and Todd Risley, "The Early Catastrophe: The 30 Million Word Gap by Age 3," *American Educator* 27:1 (2003), 4–9.
6. For example, in New Zealand, Talking Matters campaigns to get everyone talking with babies and young children under three years of age.
7. Chris Hipkins, "Our kids are achieving less than 20 years ago: Why?" *Stuff* (8 December, 2019).
8. Mary Midgley, *Utopias, Dolphins, and Computers: Problems of Philosophical Plumbing* (New York: Routledge, 1996), Chapter 1: "Philosophical Plumbing," https://philpapers.org/archive/MIDPP.pdf.
9. Ibid. 139.
10. Education Counts, "Per Student Funding," Website; Education Counts, "New Zealand Schools: Ngä Kura o Aotearoa," Report of the Minister of Education on the compulsory schools sector in New Zealand 2000 (Wellington: Ministry of Education, 2001), 48. The data has been adjusted for (CPI) inflation between Q1 2001 and Q1 2019.
11. Ministry of Education, "2018 PISA survey findings published," Website.
12. The drops were 23, 22 and 43 points in reading, science and maths, respectively (30 points is roughly equivalent to a year's worth of learning).

See Ministry of Education, "Teaching in New Zealand: Findings from International Studies – Inquiry-Based or Teacher-Directed Science? Evidence from PISA" (Wellington: New Zealand Government, 2019), 3.

13. The three graphs in Appendix 1 show how the proportion of 15-year-olds performing in each category from lowest to highest has changed since 2003.
14. Ministry of Education, "PIRLS 2016: New Zealand's Achievement" (Wellington: New Zealand Government, 2019), 8. This excludes Belgium, where the Flemish part outperformed New Zealand but the scores of the French-speaking section of that country were worse.
15. Steve May with Adam Jang-Jones and Alexandra McGregor, "PISA 2018 New Zealand Summary Report – System Performance and Equity" (Wellington: Ministry of Education, 2019), Figure 5.2.
16. Education Counts, "School leavers: Time series data – School leavers with highest attainment (2009–2019)," Website. According to the chief education scientific advisor for the Ministry of Education, "In Years 4–8 Māori students in English medium schooling typically have reading comprehension one to two years lower than Pākehā students." Office of the Prime Minister's Chief Science Advisor, "Changes needed to address drop in literacy levels, says Chief Education Scientific Advisor," Media release (Wellington: New Zealand Government, 17 August 2020).
17. See Chapters 1 and 3.
18. For PIRLS data, see Department for Education (UK), "Progress in International Reading Literacy Study (PIRLS): National Report for England" (London: 2017), Figure 2.1, 33. For PISA data, see Department for Education (UK), "Achievement of 15-year-olds in England: PISA 2018 Results" (London: 2019).
19. Chris Hipkins, "Our kids are achieving less than 20 years ago: Why?" op. cit.
20. Hirsch, Jr. E.D. "Reality's Revenge: Research and Ideology," *American Educator* 20:3 (1996).
21. Matthew Arnold, *Culture and Anarchy* (1869), cited in David Conway *Liberal Education and the National Curriculum* (London: Civitas, 2010).
22. Jean-Jacques Rousseau, *Emile*, or On Education (1762), 7, trans. Barbara Foxley (London and Toronto: J.M. Dent and Sons, 1921; New York: E.P. Dutton, 1921), Book 2.
23. Ibid.
24. Paulo Freire, "The banking concept in education," SET 1 (1974), 7. *SET: Research Information for Teachers* is published by the New Zealand Council for Educational Research (NZCER).
25. John Dewey, *Democracy and Education: An Introduction to the Philosophy of Education* (New York: Macmillan, 1916), Chapter 1.
26. Education Review Office (ERO), "Evaluation at a Glance: Priority Learners in New Zealand Schools – Findings," Website. Similarly, the NZC's principles put students "at the centre of teaching and learning."
27. Both when compared to their peers on traditional educational metrics and wider life outcomes like incarceration and employment rates.

28. Daniel Couch, "Progressive Education in New Zealand from 1937 to 1944: Seven Years from Idea to Orthodoxy," *Pacific-Asian Education* 24:1 (2012), 55–72.
29. Clarence E. Beeby, *The Biography of an Idea – Beeby on Education* (Wellington: NZCER Press, 1992).
30. Daniel Couch, "Progressive Education in New Zealand from 1937 to 1944," op. cit.
31. Paul A. Kirschner, John Sweller, and Richard E. Clark, "Why Minimal Guidance During Instruction Does Not Work: An Analysis of the Failure of Constructivist, Discovery, Problem-Based, Experiential, and Inquiry-Based Teaching," *Educational Psychologist* 41:2 (2006).
32. See the section below for evidence from experiments, and Chapter 3 for evidence drawn from the science of learning.
33. Simon Collins, "Mind the gap: The growing social divide at schools," *The New Zealand Herald* (9 May, 2020).
34. Richard E. Mayer, "Constructivism as a Theory of Learning Versus Constructivism as a Prescription for Instruction," in Sigmund Tobias and Thomas M. Duffy (eds.), Constructivist Instruction: Success or Failure? (New York: Taylor & Francis, 2009), 184–200. Cited in John Hattie, *Visible Learning: A Synthesis of over 800 Meta-Analyses Relating to Achievement* (New York: Routledge, 2009).
35. Jane Gilbert, "Untangling Constructivism, Knowledge, and Knowledge-Building for 'Future-Oriented' Teaching," SET 2 (NZCER) (2018).
36. Richard E. Clark, Paul A. Kirschner and John Sweller, "Putting Students on the Path to Learning: The Case for Fully Guided Instruction," *American Educator* (Spring 2012), 6–11, 8.
37. John Hattie, *Visible Learning: A Synthesis of over 800 Meta-Analyses Relating to Achievement*, op. cit.
38. "A one standard deviation increase is typically associated with advancing children's achievement by two to three years, improving the rate of learning by 50%, or a correlation between some variable (e.g., amount of homework) and achievement of approximately r = 0.50." John Hattie, *Visible Learning: A Synthesis of over 800 Meta-Analyses Relating to Achievement*, op. cit. 7.
39. There are drawbacks with meta-analyses, which are discussed at length in blogs such as Rob Coe, "Serious critiques of meta-analysis and effect size: ResearchED 2018," CEM Blog (5 September, 2018).
40. Ibid.
41. John Hattie, *Visible Learning: A Synthesis of over 800 Meta-Analyses Relating to Achievement*, op. cit.
42. Where K–3 refers to children in kindergarten (most children begin kindergarten at age five and attend for one year) through to Grade 3.
43. John Hattie, *Visible Learning: A Synthesis of over 800 Meta-Analyses Relating to Achievement*, op. cit. 258.
44. Ibid.

45. Of course, many students in child-centred classrooms still make progress. Dylan Wiliam says about education: "Everything works somewhere; nothing works everywhere." However, as John Hattie says: "The reason teachers can so readily convince each other that they are having success with their particular approach is because the reference point in their arguments is misplaced. What matters is what works best, not whether something works." John Hattie, *Visible Learning: A Synthesis of over 800 Meta-Analyses Relating to Achievement*, op. cit.
46. For details about the NZC's five Key Competencies, see Box 2 in Chapter 2.
47. Jane Gilbert, *Catching the Knowledge Wave? The Knowledge Society and the Future of Education* (NZCER Press, 2005), 67.
48. Ibid. 75.
49. Ibid.
50. Rosemary Hipkins, "Curriculum, Learning and Effective Pedagogy: A Literature Review in Science Education" (Wellington: Ministry of Education, 2002).
51. Ibid. 26.
52. Rachel Bolstad and Jane Gilbert, with Sue McDowall, Ally Bull, Sally Boyd and Rosemary Hipkins, *Supporting Future-Oriented Learning and Teaching – A New Zealand Perspective* (Wellington: NZCER, 2012), 12.
53. Mary Chamberlain, "Schools point the way for life of learning," *The New Zealand Herald* (4 February 2004).
54. Education Review Office (ERO), "Pedagogy for modern learners," Website.
55. Productivity Commission, "Educating New Zealand's Future Workforce: Technological Change and the Future of Work," Draft report 4 (Wellington: New Zealand Government, 2020), 17.
56. Rachel Bolstad, et al. *Supporting Future-Oriented Learning and Teaching*, op. cit.
57. Daisy Christodoulou, *Seven Myths About Education*, op. cit. 53.
58. The Economist, "Worldwide Educating for the Future Index (WEFFI)," Website. In 2020, New Zealand's position fell just two places to third.
59. Robert Peal, *Progressively Worse: The Burden of Bad Ideas in British Schools* (London: Civitas, 2014), 215.
60. Ministry of Education, "Curriculum Stocktake Report to Minister of Education" (Wellington: Ministry of Education, 2002), 5.
61. Ibid. 1.
62. Peter Roberts, "The Politics of Curriculum Reform in New Zealand," *Curriculum Studies* 6:1 (1998), 33.
63. Rosemary Hipkins, "More complex than skills: Rethinking the relationship between key competencies and curriculum content," Paper presented at the International Conference on Education and Development of Civic Competencies, Seoul (2010).
64. Ministry of Education, "The New Zealand Curriculum," Website, 37.
65. Ibid. 9.

66. Simon Collins, "Half of NZ adults flunk general knowledge test," *The New Zealand Herald* (18 November 2019).
67. It is harder to chart decline over time because the measures used by the Ministry have changed. However, overall absence figures for all schools have increased since recordkeeping began. For primary school, the absence rate began at 5.5% in 1977 and rose to 7.2% in 2002, 8.6% in 2011 and 10.2% in 2019. Education Counts, "Attendance in New Zealand Schools," Website; UK Government, "Pupil absence in schools in England: Autumn Term 2019/20," Website.
68. Ministry of Education, "Education and Training Act 2020: Amending school board objectives," Website. Chapter 4 explores this in detail.
69. In fact, these were two of the four new NCEA Level 1 science standards proposed to replace the existing standards. They were drafted in 2019–20 by the MoE's Subject Expert Group for science and put up for feedback on 1 March 2020.
70. Not only is there no plan to create a curriculum for any other history, but in 2020 the MoE also began consulting on a plan to remove Art History altogether as a subject for assessment at NCEA Level 1. Ministry of Education, "Review of Achievement Standards (RAS) – Provisional NCEA Level 1 Subject List," Website.
71. On a visit to an Auckland secondary school that was praised by ERO for its "focus is on the needs of the children," the author of this report was shown multiple open-spaces where students were variously engaged in learning. After asking to see the teaching of Year 12 or 13 science, the author was led to a single-celled, traditional science classroom where a clutch of eager students sat silently listening to an elderly physics teacher commanding the whole room.
72. Education Review Office (ERO), "Pedagogy for modern learners," op. cit.
73. To learn more about the arguments involved in the 'reading wars,' watch Australian College of Educators and the Centre for Independent Studies, "ACE/CIS Phonics Debate 2018," YouTube (Sydney: 31 July 2018).
74. Anne Castles, Kathleen Rastle, and Kate Nation, "Ending the Reading Wars: Reading Acquisition from Novice to Expert," *Psychological Science in the Public Interest* 19:1 (2018).
75. Reading recovery is expensive because unlike phonics teaching, which is whole-class, it is a one-on-one intervention between a trained adult and pupil. According to an Official Information Act request in 2018, in that year (and the two previous years), the MoE spent $25 million on Reading Recovery in primary schools. Ministry of Education, "Response to OIA request on Reading Recovery funding" (Wellington: New Zealand Government, 20 November, 2013). Among six-year-olds that year, 17% of boys and 12% of girls were involved in Reading Recovery. See Education Counts, "Annual Monitoring of Reading Recovery: 2018 Data," Website, Table 10: Number and proportion of New Zealand 6-year-olds in Reading Recovery by ethnicity and gender, 2018.

76. John Hattie, *Visible Learning: A Synthesis of over 800 Meta-Analyses Relating to Achievement*, op. cit. 130, 132, 138.
77. Simon Collins, "Phonics debate: Ministry of Education says it is not a U-turn on reading," *The New Zealand Herald* (20 August 2019).
78. Ministry of Education, "Request for Proposal," Ready to Read series (Wellington: New Zealand Government, 2019), cited in Simon Collins, "Phonics debate: Ministry of Education says it is not a U-turn on reading," Ibid.
79. Stuart McNaughton "The literacy landscape in Aotearoa New Zealand: What we know, what needs fixing and what we should prioritise" (Auckland: Office of the Prime Minister's Chief Science Advisor, 2020); James Chapman and William Tunmer, "Reading Science Advice Needs to be Based on Reading Science" (Massey University, 2020).
80. Private conversations with New Zealand researchers and officials.
81. Sue McDowall and Rosemary Hipkins, "How the Key Competencies Evolved over Time: Insights from the Research" (Wellington: NZCER, 2018), 4.
82. This was also not the first time it had been raised in New Zealand. For example, in a 1994 critique of the efforts to make university qualifications more like vocational qualifications, Victoria University professor Cedric Hall said, "Generic skills, although identifiable across a wide range of disciplines, cannot be developed independently of context. Thinking, reasoning, problem solving, etc. can only develop through study of a body or domain of knowledge." Cedric Hall, "Obstacles to the Integration of University Qualifications and Courses into the National Qualifications Framework," *Nga Taumata Matauranga 0 Aotearoa Higher Education in New Zealand*, Occasional Paper 1 (Educational Development Centres of New Zealand Universities, 1994).
83. For example, see Rosemary Hipkins, Rachel Bolstad, Sally Boyd and Sue McDowall, *Key Competencies for the Future* (Wellington: NZCER, 2014), 4, 134, 135.
84. Bronwyn E. Wood and Mark Sheehan, "Dislodging Knowledge? The New Zealand Curriculum in the 21st Century," *Pacific-Asian Education* 24:1 (2012), 17–30, 17.
85. Ibid. 18.
86. For example, although NZCER's 2014 book, *Key Competencies for the Future*, was about how to use key competencies as vehicles for curriculum change, it also cautioned: "Just to be clear – we don't see these changes as being made at the expense of developing deeper knowledge and understanding about the world. Quite the opposite: deep knowledge is integral to the various ways of being we've just summarised … But knowledge is not enough on its own." Rosemary Hipkins, et al. *Key Competencies for the Future*, op. cit. 135. However, one example of the unacknowledged conflict between this statement and others made by the NZCER is detailed in Appendix 4.

Jane Gilbert too said in 2005, "I want to stress here that this does not mean students no longer need knowledge in the old sense. Such knowledge is still important, but not as an end in itself." Jane Gilbert, *Catching the Knowledge Wave?* op. cit.

87. 'Foreground' is a verb widely used in the context of competencies by the NZCER. See Sally Boyd and Verena Watson, "Unpacking the Key Competencies: What Does It Mean for Primary Schools?" (Wellington: NZCER, 2006).
88. Education Review Office (ERO), "Pedagogy for modern learners," op. cit.
89. Education Counts, "Student population: Macleans College," Website; Brittany Keogh, "Ministry and school clash over 'flexible learning spaces'," *The New Zealand Herald* (25 February 2018).
90. University of Melbourne, "Innovative Learning Environments and Teacher Change (ILETC)," Website.
91. After all, despite holding little obvious relevance to life in the 21st century, a good university degree in Classics has long been regarded as an outstanding achievement that could command a salary premium across diverse employment fields.
92. Ministry of Education, "The New Zealand Curriculum," op. cit. 9.
93. They also tend to be larger secondary schools and considered 'traditional' or even 'elitist' by the research establishment and the MoE. Despite being some of the most popular (and hence largest) schools, and sought out by some of the country's most educated and aspirational parents, such schools feature little among those exalted by ERO and the Ministry.
94. Appendix 2 details the proliferation of NZCER publications that have already been produced to help teachers make the NZC successful.
95. Jessica Long, "Education's leaning tower: Does the Pisa international benchmark matter?" *Stuff* (5 December 2019).
96. Benjamin Riley, "Science, Data and Decisions in New Zealand's Education System" (Wellington: Ian Axford (New Zealand) Fellowships in Public Policy, 2014).
97. Daniel Willingham, *Why Students Don't Like School?: A Cognitive Scientist Answers Questions About How the Mind Works and What It Means for the Classroom* (Jossey-Bass, 2009); Rachel Bolstad, et al. *Supporting Future-Oriented Learning and Teaching*, op. cit. Table 3: What we know about learning.
98. Benjamin Riley also points out: "Curiously, the NZCER report does not itemise citations in support of its key principles." Instead, it generally cites a selection of scientific and non-scientific sources. Benjamin Riley, "Science, Data and Decisions in New Zealand's Education System," op. cit. 22.
99. Of course, as Benjamin Riley explains, there may be other benefits to personalisation – for example, attracting new talent into the profession by creating more dynamic workplaces, or encouraging the development of new technologies, but these reasons are not grounded in 'what we know about learning.'

100. For example, John Hattie's analysis found that Direct Instruction (DI) – a whole class approach to teaching described in Chapter 1 – returned an effect size of 0.59, compared to 0.2 for Individualised Instruction.
101. Rosemary Hipkins, "Different Ways of Thinking About Learning" (Wellington: NZCER, 2014).
102. Ibid. 1.
103. Daniel Willingham and David Daniel, "Teaching to What Students Have in Common," *Educational Leadership* 69:5 (2012), 16–21, cited in Benjamin Riley, "Science, Data and Decisions in New Zealand's Education System," op. cit.
104. Ibid.
105. Rosemary Hipkins, "Different Ways of Thinking About Learning," op. cit. 3..bid. 77-term memory in hu-l in- Much of it ind the facde
106. Ibid. 5.
107. Ibid. 5–6.
108. Paul A. Kirschner, John Sweller and Richard E. Clark, "Why Minimal Guidance During Instruction Does Not Work," op. cit. 76.
109. Ibid. 77.
110. Ibid. 77.
111. Herbert A. Simon and William G. Chase, "Skill in Chess," *American Scientist* 61:4 (1973), 394–403.
112. David Geary, "Principles of Evolutionary Educational Psychology," op. cit.
113. Daisy Christodoulou, *Seven Myths About Education*, op. cit. 36.
114. Daniel Willingham, *Why Students Don't Like School?* op. cit. Chapter 2.
115. Scottish Curling, "World Championship Playoff – Women's Draw 2 Match Report" (4 March, 2018).
116. Donna Recht and Lauren Leslie, "Effect of Prior Knowledge on Good and Poor Readers' Memory of Text," *Journal of Educational Psychology* 80:1 (1988), 16–20.
117. George Spillich, Gregg Vesonder, Harry Chiesi and James Voss, "Text Processing of Domain-Related Information for Individuals with High and Low Domain Knowledge," *Journal of Verbal Learning and Verbal Behaviour* 18:3 (1979), 275–290, cited in Donna Recht and Lauren Leslie, "Effect of Prior Knowledge on Good and Poor Readers' Memory of Text," Ibid.
118. Jennifer Szalai, "The unlikely life of a socialist activist resonates a century later," *The New York Times* (4 March 2020).
119. E.D. Hirsch, Jr., *The Knowledge Deficit: Closing the Shocking Education Gap for American Children* (New York: Houghton Mifflin, 2006), 74.
120. Ministry of Education, "The New Zealand Curriculum," op. cit. 12.
121. Andreas Schleicher, "The case for 21st-century learning," OECD website.
122. Ibid.
123. Ibid.
124. Ibid.
125. Ministry of Education, "Teaching comprehension," Website.
126. Daniel Willingham, "The Usefulness of Brief Instruction in Reading Comprehension Strategies," *American Educator* (Winter 2006–07), 39–50.

127. Ibid. 44.
128. For example, one researcher estimated: "(a) when the material is relatively easy then close to 0% will be unknown basic words, (b) when the material is relatively hard, then 2% or more will be unknown basic words, and (c) when the difficulty of the material is matched closely to the ability of the reader, then around 1% will be unknown basic words." 1% of words equates to one word in every 100. Ronald Carver, "Percentage of Unknown Vocabulary Words in Text as a Function of the Relative Difficulty of the Text: Implications for Instruction," *Journal of Reading Behavior* 26:4 (1994), 13–37.
129. Betty Hart and Todd Risley, *Meaningful Differences in the Everyday Experience of Young American Children* (Brookes Publishing, 1995). Since publication, Hart and Risley's methodology has been challenged and improved upon. A much larger 2017 near-replication study using modern recording technology also found that the "word gap" exists, but is smaller at about four million words by the time children turn four, not 30 million by age three. "Children whose mothers graduated from college were exposed to 3,000 or so more words per day, translating into a four-million-word gap by 4 years of age between the highest and lowest SES groups in our sample." Jill Gilkerson, et al. "Mapping the Early Language Environment Using All-Day Recordings and Automated Analysis," *American Journal of Speech-Language Pathology* 26:2 (2017) 248–265, 26.
130. George Farkas and Kurt Beron, "The Detailed Age Trajectory of Oral Vocabulary Knowledge: Differences by Class and Race," *Social Science Research* 33 (2004), 464–497.
131. Rosemary Hipkins, "Different Ways of Thinking About Learning," op. cit. .bid. 77-term memory in hu-l in- Much of it ind the facde
132. Ibid.
133. Graham Nuthall, "The Way Students Learn: Acquiring Knowledge from an Integrated Science and Social Studies Unit, *The Elementary School Journal* 99:4 (1999), 303–341, 339.
134. Although some NCEA assessments are still external, none are mandatory, and it is perfectly possible to pass the NCEA with excellence having never completed an external assessment.
135. One of the best-known critics of traditional schooling was English lecturer Sir Ken Robinson, who spoke to an audience in Auckland in 2018. Robinson's 2006 talk, "Do schools kill creativity?" is the most watched of all TED Talks.
136. Some subsets of NCEA data (on particular standards) might, in theory, be able to do this. However, they could not do so systematically, and the Ministry does not make this kind of analysis available.
137. Department for Education (UK), "Phonics Screening Check and Key Stage 1 Assessments in England, 2019" (London: 2019).
138. In England, schools have a second chance to test their students in Year 2. The proportion achieving by the end of Year 2 increased from 85% to 91% between 2013 and 2019.

139. New Zealand Education Institute (NZEI), "National Standards – A Cautionary Tale Special Report to Annual Meeting 2010" (Wellington: New Zealand Government, 2010), 2.
140. The NZCER itself concluded this in a 2008 paper on the proposed national standards: "Research, including NZCER's own longitudinal Competent Children/Competent Learners study, shows that it is important to have a solid platform of knowledge and skills in literacy and numeracy by the age of eight. It is difficult and expensive to create this platform after that age." New Zealand Council for Educational Research (NZCER), "NZCER background paper on national standards for literacy and numeracy" (Wellington: 2008).
141. Department of Corrections, "Our story," Website, cited in Caroline Seelig and Leanne Rate, "The Role Distance Learning Has to Play in Offender Education," *Journal of Learning for Development* 1:1 (2014).
142. For example, the NZEI quoted the NZCER: "Of course focussing on a narrow slice of curriculum in a repetitive way means teachers are likely to see a boost in performance in that narrow area, students can be put on a treadmill of rote learning, backed up by worksheets, and there is likely to be a result." New Zealand Education Institute (NZEI), "National Standards – A Cautionary Tale Special Report to Annual Meeting 2010," op. cit.
143. For example, in 2011 or 2012 (n.d.), the NZEI's then president Ian Leckie said: "We need to drop National Standards and go back to proper assessment tools … Parents can get the best information about their child's progress and the school's effectiveness by visiting the school and talking to teachers." New Zealand Education Institute (NZEI), "NZEI Te Riu Roa backs call for closing National Standards website," Website.
144. To track national trends over time, the MoE contracts a collaboration between NZCER and The University of Otago to run the National Monitoring Study of Student Achievement (NMSSA). NMSSA assesses the performance of nationally representative samples of students in Years 4 and 8 in English-medium schools against the expectations of the NZC. NMSSA began in 2012, and each of the NZC's eight learning areas is assessed over a five-year cycle. See Charles Darr, "The National Monitoring Study of Student Achievement: Wānangatia te Putanga Tauira," SET 2 (2017), 57–60.

    By way of example, in science in 2017, NMSSA found that 94% of Year 4 students and just 20% of Year 8 students were achieving at or above curriculum expectations. For all outcomes, see University of Otago, "Learning Area Reports," Website, https://nmssa.otago.ac.nz/reports/index.htm#6.
145. For example, Joel Hernandez, "In Fairness to our Schools: Better Measures for Better Outcomes" (Wellington: The New Zealand Initiative, 2019). However, the value of any insights is limited by the unreliability of the final measures of school outcomes, which are currently the NCEA and UE (University Entrance).

146. Ministry of Education, "Careers in education," Website.
147. Jessica Long, "Education's leaning tower: Does the Pisa international benchmark matter?" op. cit.
148. According to a September 2020 MoE response to an Official Information Act request, in addition to the work it does through its annual grant, in the year to mid-June 2020, the NZCER undertook MoE-commissioned contracts worth more than $3.3 million. According to the NZCER's Annual Report 2018–19, for the previous year (ended 30 June 2019), its Receipts from Customers (which excludes the grant) were just under $10 million. MoE contracts appear to make up about one-third of the NZCER's business. When their government grant is included, this rises to between 40% and 50% of its revenue. In addition to its work for the MoE, the NZCER also does work for other government agencies and departments, including the Productivity Commission, the TEC, The Teaching Council, the Defence Force and the Ministry for Children (Oranga Tamariki). Ministry of Social Development (MSD), "Pūrongo ā-Tau Annual Report: 2018–2019" (Wellington: New Zealand Government, 2019); New Zealand Council for Educational Research (NZCER), "Who we work with," Website.
149. Despite this, the work of the assessment arm of NZCER's business, which produces standardised tests like PATs and sells them to schools commercially, is evidence-based and of high quality. New Zealand Council for Educational Research (NZCER), "Understanding PATs – for parents and the community," Website.
150. The sunk cost fallacy describes how individuals persist with a behaviour or endeavour due to having invested resources in it.
151. Rachel Bolstad, et al. *Supporting Future-Oriented Learning and Teaching*, op. cit.
152. Cathy Wylie, "National Survey," NZCER website.
153. Teaching and Learning Research Initiative (TLRI), "Research projects to improve outcomes for learners share $1.4 million in funding," Media release (5 December 2018).
154. Tomorrow's Schools is the name given to the 1989 reforms that dramatically changed the governance, management and administration of New Zealand schools. Tomorrow's Schools Independent Taskforce, "Our Schooling Futures: Stronger Together Whiria Ngā Kura Tūātinitini," Final report (Wellington: Ministry of Education, 2019).
155. Ibid. 4.
156. On page 93, it does describe an expectation that "every school/kura would report annually to its Education Support Learning Network regarding agreed indicators of progress and achievement, wellbeing and belonging, and this data would be available to the public online." However, for such reporting to be meaningful, the taskforce needed to call for the introduction of some national standardised assessments, which it did not.
157. For example, following the Tomorrow's Schools Review, the MoE announced the establishment of "a new improved support function, an Education Service Agency (ESA)" and "a nationally based Curriculum

Centre to provide curriculum leadership and expertise." Ministry of Education, "Supporting All Schools to Succeed: Reform of the Tomorrow's Schools System" (Wellington: New Zealand Government, 2019), 14, 33.

158. Various, "Minister Hipkins: It's time to listen!" Scoop (n.d.).
159. Ministry of Education, "Kōrero Mātauranga: NCEA Review Professional Advisory Group," Website.
160. Chris Hipkins, "Vocational education to take centre stage in schools," Press release (Wellington: Ministry of Education, 1 February 2020).
161. For example, in a report titled "Communities of Learning | Kāhui Ako: Collaboration to Improve Learner Outcomes," ERO referred to these dual goals as "the number one challenge facing the New Zealand education system." Excellence and equity were the foundational for the terms of reference for the review of Tomorrow's Schools. They also form the basis of the analysis conducted on the OECD's PISA data.
162. Steve May with Adam Jang-Jones and Alexandra McGregor, "PISA 2018: New Zealand Summary Report – System Performance and Equity," op. cit. 25.
163. Ibid. Figure 5.2.
164. From 15% to 22%, and 21% to 12% in maths; from 14% to 19%, and 19% to 13% in reading; and from 14% to 18%, and 18% to 11% in science.
165. This phrase was coined by American speechwriter Michael Gerson.
166. Ministry of Education, "Education and Training Act 2020: Giving better effect to Te Tiriti o Waitangi at the national level," Website.
167. Michael F.D. Young, *Knowledge and Control: New Directions in the Sociology of Education* (Collier-Macmillan, 1971), cited in Peter Wilby, "The counterculture class warrior who turned to Gove," The Guardian (9 October 2018).
168. Michael Young, "Why Start with the Curriculum?" cited in Michael Young and David Lambert (eds.), *Knowledge and the Future School* (London: Bloomsbury, 2014), 55.
169. Graham McPhail and Elizabeth Rata, "Comparing Curriculum Types: 'Powerful Knowledge' and '21st Century Learning'," *New Zealand Journal of Educational Studies* 51:1 (2015).
170. Department of Education (South Africa), "Report of the task team for the review of the implementation of the national curriculum statement" (Pretoria: 2009), 61, cited in Ursula Hoadley, "Michael Young and the curriculum field in South Africa," *Journal of Curriculum Studies* 47:6 (2015), 733–749, 742.
171. Ibid.
172. Michael Young, "Why Educators Must Differentiate Knowledge from Experience," *Pacific-Asian Education* 22:1 (2010), 9–20, cited in Megan Lourie and Elizabeth Rata, "A Critique of the Role of Culture in Maori Education," *British Journal of Sociology of Education* 35:1 (2014), 19–36, 31.
173. Michael Young, David Lambert, Carolyn Roberts, and Martin Roberts, *Knowledge and the Future School: Curriculum and Social Justice* (Bloomsbury Academic, 2014), 74.

174. Ibid.
175. Tomorrow's Schools Independent Taskforce, "Our Schooling Futures," op. cit. 15.
176. Gabriel Heller-Sahlgren, "The Achievement-Wellbeing Trade-off in Education," Research report 14 (London: Centre for Education Economics, 2018).
177. In defending the NZC, some MoE officials suggest that although the curriculum does not prescribe knowledge, significant guidance is available elsewhere. For example, Te Kete Ipurangi (TKI), or the Ministry's 'online knowledge basket' has existed since 1998. It contains information, resources and some curriculum material. In Finland in the 1980s, a high-level curriculum was coupled with state-controlled textbooks to great effect. However, TKI provides nothing like the coherence or support of a state-controlled textbook. To suggest that because TKI exists, the NZC is not constructivist or competency-based is untrue. In fact, as Appendix 2 showed, for the past two decades both the MoE and the NZCER have been at pains to emphasise how the NZC 'foregrounds' not knowledge but competencies.
178. For example, Post Primary Teachers' Association (PPTA), "PPTA Workload Taskforce Report: Report of the 2015 Investigation into Issues of Workload Intensification for Secondary School Teachers in New Zealand" (Wellington: 2016).
179. Culturally responsive pedagogy should be used to ensure the curriculum is effectively taught. Culture may affect optimal lesson structures and teaching methods. It may also affect the hooks and introductions teachers use to motivate and engage their students. However, it should not affect *what* is taught.
180. Under the Education and Training Bill 2020, Boards of Trustees must focus on a wider range of objectives described as "what matters most for learners and their whānau". Now, educational achievement is no longer boards of trustees' only primary objective: "It is instead one of four primary objectives, alongside objectives for schools to ensure the physical and emotional safety of students and staff, that they are inclusive and cater for students with differing needs and that they give effect to Te Tiriti o Waitangi." Ministry of Education, "Education and Training Act 2020," Website.
181. The English Baccalaureate (EBacc) is a set of five subjects assessed at age 16 that keeps students' options open for further study and future careers. It is made up of English language and literature, maths, the sciences, geography or history and a language. In league tables, as well as reporting the proportion of a school's students who achieves a minimum number of subjects, schools also report the proportion of their students who achieved in at least these five core areas. This helps deter schools from merely funnelling students through 'less academic' pathways to achieve higher 'measured' outcomes.
182. Education Endowment Foundation, "The EEF guide to supporting school planning: A tiered approach to 2020–21," Website.
183. OFSTED, "Education Inspection Framework: Overview of Research," No. 180045 (London: UK Government, 2019).

184. Daniel Muijs, "Developing the education inspection framework: How we used cognitive load theory," OFSTED blog (UK Government, 13 February 2019).
185. Centre for Education Statistics and Evaluation (CESE), "Cognitive Load Theory: Research that Teachers Really Need to Understand" (Sydney: NSW Department of Education, 2017).
186. Department for Education (South Australia), "Phonics screening check," Website.
187. Cedric Hall, "Obstacles to the Integration of University Qualifications and Courses into the National Qualifications Framework, op. cit. cited in Michael Irwin, "Curriculum, Assessment and Qualifications" (Wellington: Education Forum, 1994), 13.
188. Graham Nuthall, "The Way Students Learn," op. cit. 339.
189. Bronwyn E. Wood and Mark Sheehan, "Dislodging Knowledge? The New Zealand Curriculum in the 21st Century," op. cit. 28.
190. Yates, Lyn. and Collins, Cherry. "The absence of knowledge in Australian curriculum reforms," *European Journal of Education*, 45(1), (2008), 90, cited in Bronwyn E. Wood and Mark Sheehan, "Dislodging Knowledge? The New Zealand Curriculum in the 21st Century," op. cit. 28.
191. Efrat Furst, "How to promote deep understanding in your classroom" (Auckland: The Education Hub, n.d.).
192. Elizabeth Rata, "NZ's knowledge blind spot," Newsroom (19 February 2019).
193. Adam Jang-Jones, "Inquiry-Based or Teacher-Directed Science? Evidence from PISA" (Wellington: Evidence, Data and Knowledge, Ministry of Education, 2019).
194. The various evaluation reports are available at Ministry of Education, "Charter Schools Policy Development," Website.
195. New Schools Network, "Free schools: The basics," Website.
196. UK Government, "Academic Year 2019/20: Schools, pupils and their characteristics," Website.
197. UK Government, "All multi-academy trusts (MATs) / sponsors: Performance with school & pupil numbers, 2019 key stage 4 all pupils," Website.
198. To see how well these schools perform, view Ministry of Education data dashboards at UK Government, "Find and compare schools in England," Website.
199. Ministry of Education, "The New Zealand Curriculum," Website, 12.
200. See international data in the Introduction.
201. Rather than the longstanding declines in achievement, or relative underperformance compared to other English-speaking countries, the Ministry of Education's press release following the publication of the latest PISA data focused on New Zealand's high rates of bullying and "concerning trends on reported well-being." Its press release on the latest OECD analysis said "our people are better educated than ever before." Ministry of Education, "2018 PISA survey findings published," Media release

(Wellington: New Zealand Government, 4 December 2019); Ministry of Education, "OECD's Education at a Glance 2020 report," Media release (Wellington: Ministry of Education, 8 September 2020).

202. However, care must be taken not to create a system in which adverse background characteristics become excuses for low attainment or progress in school.
203. Education Conversation (Kōrero mātauranga), "NCEA Change Package 2019 Overview" (Wellington: Ministry of Education, 2019).
204. Rosemary Hipkins, et al. *Key Competencies for the Future*, op. cit. 21.
205. Rosemary Hipkins, "More complex than skills: Rethinking the relationship between key competencies and curriculum content," op. cit.
206. Rosemary's Hipkins' speech acknowledging that NZC's competency focus meant significantly reducing curriculum coverage was made in Seoul but published in New Zealand. It is puzzling that she withheld discussing this practical reality of the NZC in New Zealand.

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There is a rot at the core of schooling in New Zealand.

The Ministry of Education follows unscientific advice and is in thrall to a flawed philosophy.

Debates and dichotomies abound in education. They cover everything from *what* to teach and *how* to teach, to what it means to be free. Most teachers aim somewhere in the middle. They steer clear of extremes.

However, the status quo in New Zealand is far from ordinary.

By appealing to the seductive idea that children should be at the centre of decisions about their education, knowledge is being sidelined. Child-centred orthodoxy tells teachers they must let their pupils lead.

As a consequence, educational standards have plummeted over the past two decades. Where New Zealand children once topped international league tables, they now perform mediocrely. Educational inequity is also worse here than in all comparator English-speaking countries.

This report explores the origins of child-centred ideas and their unchecked influence on education policy. It contrasts what is known about how humans learn with what teachers and parents are told by 'researchers' and 'authorities.' Finally, it outlines how to create the corrective shift that will reverse the decline and narrow the inequities that so perplex and embarrass this country.

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