The right drivers for whole system success

MICHAEL FULLAN

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Introduction

This paper is intended to provide a comprehensive solution to what ails the current public school system and its place in societal development – a system that is failing badly in the face of ever complex fundamental challenges to our survival, let alone our thriving as a species. What follows is a 'big' proposal. Once started the 'four drivers' feed on each other as a system in motion. **Most important, the timing is right.**

The COVID-19 pandemic has upended virtually every aspect of humanity as we know it, shaking current civilisation to its foundation. Amidst the death and destruction is a disruption so fundamental that it loosens and discombobulates the system in a way that creates openings for transforming the status quo. Most significantly, it generates conditions that are conducive to pursuing the very paradigm that I outline in this paper.

I won't focus in detail on the pandemic itself except to set the context for radical change. The immediate consequence is chaos, impressively captured by Nicholas Christakis (2020) in his analysis, *Apollo's Arrow: The Profound and Enduring Impact of* ***Coronavirus*** *on the Way We Live.* Using past pandemics and current developments Christakis analyses what he labels as 'the immediate pandemic period', 'the intermediate pandemic period' and 'the post-pandemic period' – a time span covering 2020 to 2024. In practical terms, humans will grapple with chaos, survival,

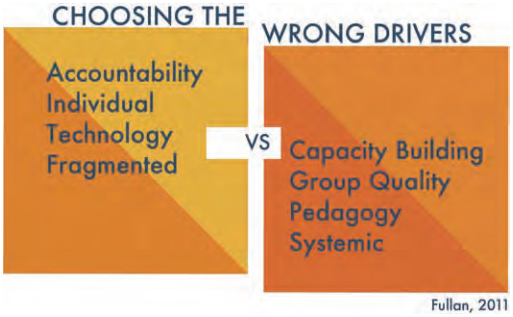
innovative breakthroughs, destructive elements, and more. The best stance we can take is to know that almost everything will be different. In short, this prolonged ambiguity creates a tangible opportunity to make positive change happen.

A necessary immediate priority is to address the first order upheaval. Our deep learning team offered an early analysis and framework in a report we released in June 2020 called *Education Re-imagined: The Future of Learning* (Fullan et al). We are working on an update that will be available by mid-2021. These reports call for attending first to wellbeing; for addressing basic needs like food, safety, shelter, access to resources; for using the opportunity to move toward what I later call 'global competencies' (character, citizenship, collaboration, communication, creativity, critical thinking). Above all, we recommend avoiding a 'loss of learning' mindset that would take us back to traditional learning – to a system that we know was not working for the vast majority of students.

What then would the new model look like? I start back a decade ago. The current year, 2021, is the 10th anniversary of a popular policy article I published entitled *Choosing the Wrong Drivers for Whole System Reform* (Fullan, 2011). System reform is about the whole system – a state, province, national entity. A driver is a policy – a wrong driver is a policy that does not work or makes matters worse. Our team had been working actively on system reform since 1997 when we assessed the English National Literacy and Numeracy Strategy, followed quickly by the Ontario reform (2003 onward), advice and capacity building in California, Victoria and other places. We had also spent a decade conducting hundreds of workshops across Australia, New Zealand, United Kingdom, Canada and more.

On one occasion, after a very productive workshop in Melbourne, the organisers (the Centre for Strategic Education) observed that our ideas were really hitting the mark, but that these proposals were not at all like the actual policies that were in place. They asked if I would do a paper on the subject. Because we had been grappling with these ideas we quickly came up with the title 'Choosing the Wrong Drivers' theme. The paper (Fullan, 2011) focused on four pairs of drivers, which were

- accountability (vs capacity building);
- individual (vs group quality);
- technology (vs pedagogy); and
- fragmented (vs systemic).



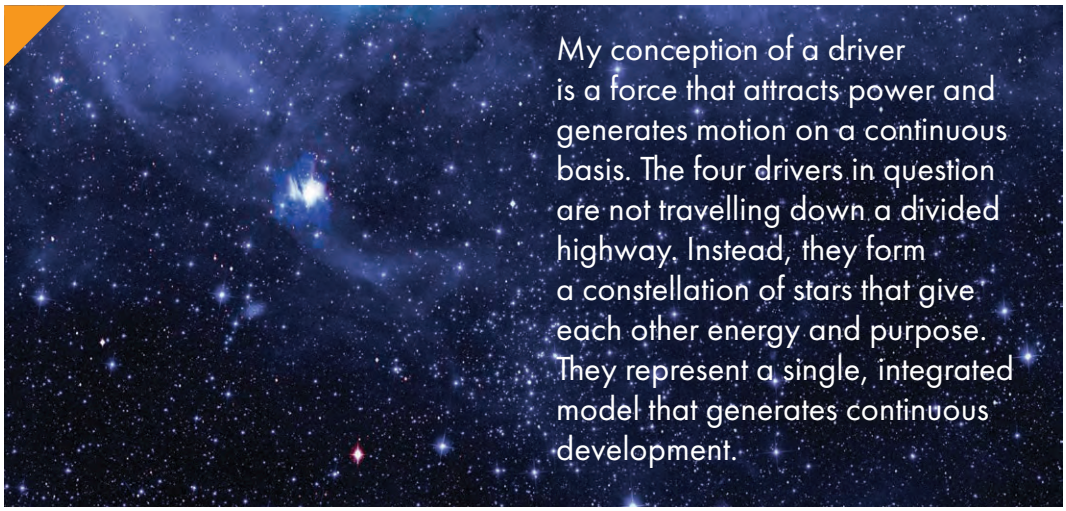
The focus of the 2011 paper was very much on how policies and strategic actions seem to be dominated by assumptions akin to the wrong drivers. It was not that they had no merit, but rather that they did not serve to 'lead' system change. The paper was a big hit, particularly in Australia, the US and the UK. Practitioners instantly recognised that they were on the wrong end of the policy stick (and I think many policy makers did as well, but they did not have an alternative). At the time, I was not paying much attention to the new Asian front runners in the OECD's PISA assessment of literacy, numeracy and science results: Hong Kong, Japan, Singapore, Shanghai and South Korea (more about them later).

Over the past decade the 'wrong drivers' paper was received favourably in many local jurisdictions (schools and local authorities) and even garnered some interest at the policy level (in California, and Victoria for example). However, the analysis never carried the day in reformulating system change. One reason was that the spotlight was mostly on what was 'wrong'; second, the so-called right drivers did not represent a coherent theory; third, the right drivers were never complete enough to influence the rapidly growing complexity of society in the 21st century – they were never strong enough to affect inequality, which is endemic to the system we have come to have. Joanne Quinn and I got a start on the solution in our book, *Coherence: The Right Drivers in Action for Schools, Districts, and Systems*, but the ideas did not go widely or deeply enough for system change (Fullan and Quinn, 2016).

The question now is whether 2021 might be the best time for getting the 'right drivers right' and, of course, what would the drivers be? There are several reasons why the time is now: global society is rapidly worsening and has been for some time; there is climate collapse, galloping inequality, deepening mistrust and increased stress for adults and the young alike; all of this prior to the COVID-19 pandemic (see Fullan and Gallagher, 2020).

The pandemic phenomenon itself may serve to accelerate the solutions as we find silver linings and golden pockets, precisely because of ever-growing dissatisfaction with the status quo, and the new openings that COVID-19 dissolution unveils. The timing is also propitious because we have gained an understanding of so much more in the past five years about learning, technology, people and the most powerful levers for positive transformation. The pandemic has caused us to take two or more steps backwards and, indeed, has exposed fundamental flaws in our learning systems. COVID-19 could turn out to be the catalyst needed to leap forward, but only if we act forcefully on what I call the 'right drivers'.

The model for education currently in place is badly out of date. Correspondingly, a new and better education system would be one of the very few avenues for surviving in the short run, let alone thriving in the longer future. Thomas Kuhn (1962), in his book *The Structure of Scientific Revolutions*, made the case that scientific models, or paradigms as he called them, sometimes run their course. He said that two conditions are necessary for change to happen: one is that the current system becomes 'catastrophically ineffective' (which, I would argue, is now the case); the other requirement is the presence of an alternative paradigm to take its place.



The four right drivers, in combination – what I have called 'the human paradigm', constitute the proposed new model for governing the future of education (see Figure 1). My conception of a driver is a force that attracts power and generates motion on a continuous basis. The four drivers in question are not travelling down a divided highway. Instead, they form a constellation of stars that give each other energy and purpose. They represent a single, integrated model that generates continuous development.

The four new wrong drivers are not completely wrong. It is just that if left alone they take us in a negative direction. Let's name them and give them nicknames (in parentheses).

1. Academics Obsession (selfish)
2. Machine Intelligence (careless)
3. Austerity (ruthless), and
4. Fragmentation (inertia).

They have been operating for 40 years, and with ever-growing intensity. Together they are the 'bloodless paradigm', lacking care, empathy, and civic awareness – the things that make us humans. The new right drivers, by contrast, capture and propel the human spirit. Again these are offered with nicknames.

1. Wellbeing and Learning (essence)
2. Social Intelligence (limitless)
3. Equality Investments (dignity), and
4. Systemness (wholeness).

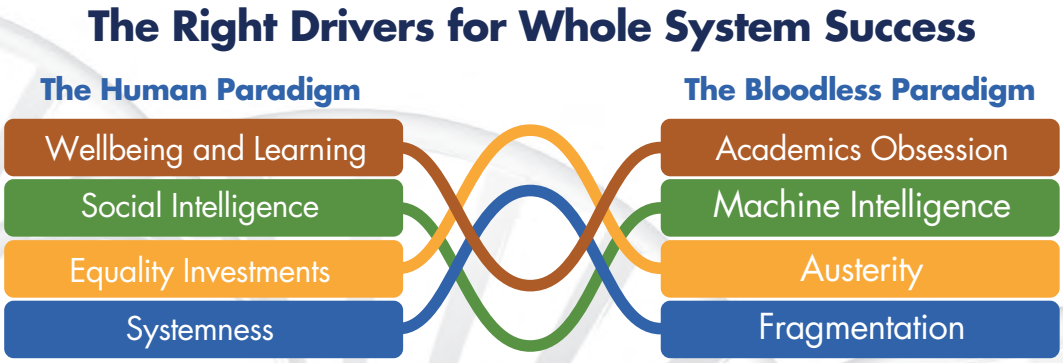
They are the human paradigm and presently constitute a work in progress. We have barely begun to tap their potential.

A fascinating analysis of the evolution of America, from the late 1800s to the present, was recently released by sociologist Robert Putnam with Shaylyn Garrett (2020). Their book is titled *The Upswing: How America Came Together a Century Ago and How **WE** Can Do It Again.* Using thematic evidence about economics, politics, society and culture, the authors make the case that the US has gone through periods of

- 'I-ness' (self-centredness) – 1870s to 1890s;
- 'We-ness' (concern for others) – 1900 to 1970s; and back to the present period of
- excessive 'I-ness' – late 1970s to the present.

Reading the tea leaves, Putnam and Garrett speculate that 2021 onward could be another 'We' period. In many ways the prospect of the right drivers in combination makes such a positive case. So, what are the new more promising right drivers for system change?

Figure 1. The Drivers



For each pair of drivers we will start with the wrong drivers – what they are and how they have taken root in the last four decades. They do not really form a deliberate system, but in effect they rely on each other.

- Academics[1] Obsession favours the elite. The privileged in turn figure out and exploit the narrow academic assessment system.
- Machines have a life of their own, because the market system and big companies inherently and relentlessly contribute to their endless expansion. Rapacious growth is their habit.
- Austerity evolves naturally in a system where the rich take the lion's share of profits and all others are left with little.
- Fragmentation by default favors inertia, and deepens existing systems of prejudice and discrimination.

the drivers are not always in opposition to each other but can form complementary pairs, provided that the right driver is the lead.

This is the current state of affairs – a system destined to run itself into the ground.

The four right drivers, by contrast, have the potential to change the dynamics radically. In a real sense they are our only hope to alter the current catastrophic pathway toward destruction, and possible denouement. The set of right drivers requires a depth of understanding and action across many levels. To achieve this kind of radical change we will need to appeal to four different constituencies that I will label *locals, regionals, staters (state and federal),* and *globals* (leaders who work across countries).

- Locals include students, parents and community members.
- Regionals are district and municipal staff.
- Staters are state-level and federal players.
- Globals are those who act across entities (and, of course, they will come from the other three groups).

The drivers feed on each other, and as such stimulate reciprocal action. The difficulty will be how to get the right drivers started into action in a way that drives coordinated, sustained action. This is the focus of this paper.

I express the pairs of drivers with the interjection: vis-à-vis. The latter means 'in relation to' not 'versus'. I make this point to note that the drivers are not always in opposition to each other but can form complementary pairs, provided that the right driver is the lead. Put another way, the 'wrong drivers' can be helpful as long as they are in support of the right drivers – something that is eminently doable if we position the right drivers as dominant. The primary recommendation in this paper consists of a radical shift in focus toward the powerful right drivers as a set, while paying attention to the wrong or 'supporting' drivers in order to reposition them to contribute in the way that they should. For example, technology has a great deal to contribute – potentially. In one sense a large part of the problem is that humans have fallen behind, not just that technology has become more powerful.

Galloping inequality (in resources and opportunity) has raced ahead since the end of the 1970s, **despite considerable new expenditure directed at equity.** Over these forty years the goal of greater equity has made little net difference on the system, save for a few 'positive outliers'. There is no discernable impact because the solutions tried were piecemeal. As such they did not seriously attack inequity. I will take this up more directly when we get to Right Driver 3, 'Equality Investments'. The economic system that has resulted in rapidly increasing economic inequity is not the only system that prevents many people from achieving fundamental equality. 'Systems' of colonial, racial, gender/sexual, class domination, and others, also contribute importantly. In short, there are multiple 'systems of oppression' at work.

Some of the breakthroughs will be achieved through political actions and uprisings. At the same time, we need to examine how the system itself (defined as everyone in it) might be changed through actions arising from mounting dissatisfaction at all levels of the current situation and its trajectory. One ray of hope is our tentative finding that all students can benefit from better education, **especially those who are currently most disconnected.** (Fullan, Quinn and McEachen, 2018). They have the most emotional experience and connection to what is wrong, and as such can be major sources of personal and collective action required for positive change. Emotion and new dignity may be the most powerful force and hope for change that we have. The four right drivers, in integrated concert, represent potentially powerful system change in action.

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As we work through the model I will start in each case with a discussion of what is wrong with the wrong driver in question, followed by a consideration of how the right driver would work. Wrong drivers on balance reinforce the status quo. Each right driver may initially move at a different pace, but sooner than later they must converge, gaining additional strength from the interaction between and among the set.

As part of mounting the right drivers, we can also take steps to turn the wrong drivers into better supporting roles. The net effect would be the acceleration of positive change and new breakthroughs. One troubling question is who is responsible for activating the right drivers, and the answer is **everyone** (see Right Driver 4). More helpfully, any group or subgroup can and should take action within and connecting drivers, seeking allies all the time, leveraging new developments consistent with the set of drivers.

In the conclusion I will revisit the big question of what are the prospects for radical change in trends of the kind envisaged by Putnam and Garrett? The world is now in a precarious state, which is to say that the future could go either way: the collapse of society – the current trajectory – or the transformation of the global system along the lines of the four right drivers. The key agent for the future prosperity of humankind and the planet is the activation of a new learning system built on the evolutionary advantage that we possess but are in danger of squandering. First, we dig into learning itself, which has been badly distorted over the past 50 years or more. We are palpably losing ground on the measures that matter.

We now turn to the drivers themselves starting with the first pair: Wellbeing and Learning.

Wellbeing and Learning vis-à-vis Academics Obsession

Academics Obsession

Let me frame the argument clearly, because some of it is nuanced. The pervasive obsession with academic grades and degrees, and corresponding elite rewards at the expense of other people (and I will show at the expense of the 'winners' themselves) results in narrow learning that severely distorts what people learn and need in the 21st century. Even those students who are 'successful' are not prepared for life. Instead, my argument will be that by integrating wellbeing and academics we establish learning as something that prepares all students for the ever-complex world we live in. In the next section (Wellbeing and Learning) we will establish the key relationship between the United Nations' *Sustainable Development Goals (SDG)* – Goal 3 (Good health and wellbeing), and Goal 4 (Quality education). In effect, they become integrated partners as codrivers to transform the current system.

As wellbeing has come more to the fore, there is an initial tendency to treat it as 'the absence of ill-being'. Programs to treat ill-being, like anti-bullying, drug and alcohol treatment programs, and stress reduction, are essential, but they are reactive to obvious wrongs in the culture of the school and society. They are not programs to promote wellbeing itself. The latter speaks to students finding school as a place where they feel good about themselves and the person they are becoming; where they have opportunities to develop or strengthen positive values in themselves and in their colleagues; where they influence their own environments (in school, in the community, in their world); and where student voice and agency are not so much 'permitted', but are deliberately activated as a natural byproduct of the culture built in the school and the system as a whole.

In the meantime, Academics Obsession prevails, involving both the learning system and the related assessment of learning outcomes. Sandra Milligan is a Professor and Director of the Assessment Research Centre at the Melbourne Graduate School of Education. In her current research she brought together a large number of young people who were in Year 11 or 12, or were recent secondary school graduates, and asked them 'to what degree did your 12 years of schooling fit you for what you are doing now or expect to do'? As Milligan reports, 'they were virtually unanimous in saying that their schooling was far too narrow for what they are doing now, and expected to do in the future; and that their schooling was dominated by academics and narrow subject focus'. When asked what they really valued, they described part-time work, community activities and other supplementary experiences beyond school. It was these 'out of school' experiences, they said, that gave them the know-how, attitudes, values, skills and confidence – things that they felt they did not get at school, and that were really valuable to set them up for future challenges (Milligan, 2020a; see also Milligan, 2020b).

Heather Malin is the Director of Research at the Stanford University Center on Adolescence. In several studies Malin (2018) probed students about education and their purpose at school. At best she found that students were out to get good grades, go to university and get a good job. At the end of several studies Malin concluded that only about 24 per cent of senior high school students 'have identified and are pursuing a purpose for life' (p 1).

Let's capture what is happening here. Academics Obsession is **not a primary intrinsic motivator** for most students (nor even for many of the apparently successful ones). We will see shortly that wellbeing (purpose, meaning, belongingness, control, making a contribution) is of greater intrinsic interest, which in turn can lead to deeper academics. Let's stick with the 'successful' group for a moment. We move to the exceedingly successful students in the US, based on Daniel Markovits' (2019) *The Meritocracy Trap*. Markovits describes how extreme elitism over the past 40 years in the US has driven a wedge between the middle class and the rich. He documents how elaborate elite education produces 'superordinate workers' who privilege their positions in the job hierarchy, within which 'the new elite invests its income in yet more elaborate education for its children. And so the cycle continues' (p 11). Over time the gap between the superrich and the middle class increases as the former is driven upward and the latter downwards, to the current point where 'the academic achievement gap between rich and middle-class school children is now markedly greater than the achievement gap between middle-class and poor children' (p 26). By 2018, for example, the rich/middle class income gap became nearly double what it was in 1970 (p 135).

Few of us will feel sorry for the academic elite but Markovits documents how these elite schools have suicide rates four times the national average, and that '54 per cent of students displayed moderate to severe symptoms of depression and anxiety' (p 42).

Incidentally, we see this phenomenon in the top PISA/OECD performers in Asia (South Korea, Shanghai) where parents push their children (or may not have to as their offspring fall in line) to study and go to after-hours prep schools in order to get into elite schools (and indeed go to second tier prep schools in order to get into better prep schools). Anxiety, stress and suicide rate have all increased dramatically in the past decade with many young children studying 4 or more hours per day beyond their in-class time. The point is that Academics Obsession harms everyone up and down the system. Markovits concludes that 'the excessive and ruthless training through which meritocracy makes the elite, does not elevate the human spirit as much as crushes it' (p 116). The negative spinoff damages the whole system.

In the same vein, and deeper, Michael Sandel (2020) exposes *The Tyranny of Merit*. Sandel starts with a similar point to Markovits, that the system is rigged to favour the elite (eg, two-thirds of attendees at Ivy League schools come from the top 20 per cent of the income scale, and so on). The 'admissions obsession' says Sandel 'has its origins in the growing inequality of recent decades' (p 12). Above all else, and come hell or highwater, elite parents wanted 'the meritocratic cachet that admission to elite colleges confers' (p 1).

Those who succeed at the bad game do not necessarily go unscathed. Sandel calls this group 'wounded winners'.

During the recent prolonged period (the forty years since 1980) this Academics Obsession and its societal correlates served the super elite well. Since the late 1970s in the US 'most of the nation's income gains have gone to the top 10 per cent, while the bottom half received virtually none. … In real terms the median income for working-age men, about $36,000, is less than it was four decades ago' (Sandel, p 22). We also know that the rate of mobility (doing better than your parents), after 30 years of steady movement upward (1945–1975) flattened to virtually zero on the average since the late 1970s. It does not take a genius to know that during this same period inequality has galloped ahead at an ever-increasing speed. It does take some insight to know that the remedy for this is not focusing only on the 'individual' to get a better education. **It is the system that needs fixing**: 'the rhetoric of rising now rings hollow' says Sandel (p 25). Thus, 'of children born in the 1940s almost all (90 per cent), earned more than their parents; of children born in the 1980s, only half surpassed their parents' earnings' (p 75). Sandel concludes that the meritocratic ideal, fixed and narrow and unfair as it is, generates 'morally unattractive attitudes'; 'among the winners, it generates hubris; among the losers, humiliation and resentment' (Sandel, p 25). Let this toxic mix percolate for a few decades, and you have Donald Trump (or Brexit etc).

Let's talk 'wrong driver' here. Inequality under the circumstances of extreme meritocracy is not due mainly to a failure of education; it is more a failure of the system in place (both in ground rules and in content). Don't make your strategy hinge on telling those not succeeding **to get better at a bad game!** Of course, we want people to go to college and succeed, but my conclusion is that the current system can never accomplish this on any scale (but the four right drivers can).

There is more. Those who succeed at the bad game do not necessarily go unscathed. Sandel calls this group 'wounded winners'. There is a long list of anxiety-ridden, high-stress impacts on students who do find themselves playing the bad game, leading to the following conclusion, cited by Sandel.

> *In spite of their economic and social advantages, they experience among the highest rates of depression, substance abuse, anxiety disorder, somatic complaints, and unhappiness of any group of children in this country.*
>
> (2020, p 179)

What about those who become apparently successful adults, ending up as CEOs, cabinet members, and other prominent leaders? Again there are exceptions, but let's start with the question: 'Are smart highly educated people good at life?' (It's a rhetorical question). The proportion of elected government members who have university degrees has been rising for the past forty years. In the UK, 88 per cent currently have university degrees, and most of them came from private schools (Sandel, 2020, p 101). President Obama followed the same pattern, with all but three cabinet members holding advanced degrees.

Here is the nuanced part. They are smart, but are they good at life – their own and those whose lives they are expected to improve? Let's say most are proven 'academically', but are they good system leaders – mobilising and improving the lives of the greater population? Here is Sandel's conclusion (2020, p 90).

> *Having well-educated people run the government is generally desirable, provided they possess sound judgment and a sympathetic understanding of working people's lives – what Aristotle called practical wisdom and civic virtue – but history shows little connection between prestigious academic credentials and either practical wisdom or an instinct for the common good in the here and now.*

Even more nuanced, educated people who did not come from struggle can be cognitively empathetic, but not necessarily 'emotionally' empathetic in relation to people in difficult circumstances. Moreover, and to complete the point, we have had little mobility for 40 years, so we have not benefited from people who were successful because they came up the hard way – parents sacrificed, son or daughter benefited, who in turn raised their children – which, in effect, created a pathway and pipeline of people who have practical as well as academic wisdom. There are a few who succeed despite their circumstances, but they tend to be exceptions that prove the rule. Overall, we are less well-off societally because we have not benefited from the mobility that could have accompanied these four decades of the development of human and social capital. More broadly, the 'sorting role' of Academics Obsession produces leaders in all sectors who are unlikely to be balanced in the cognitive and wellbeing qualities that are essential for leading in the 21st Century (see Fullan, 2020). Of course, additional criteria beyond academic achievement are used in making appointments of leaders. We can see this at work in President Joe Biden's minority appointments of Vice President Kamala Harris, and Secretary of Education Miguel Cardona. But why not make qualities, such as character, citizenship, empathy, part of a core education in the first place so that the pool of candidates becomes wider and deeper? Why not be guided by right driver 1, rather than by its narrow counterpart? Why not produce scores of graduates who are 'good at learning, and good at life?

Until we make this shift we will never achieve equity. One reason that increased equality has barely budged, despite 50 years of investment, is that the wrong drivers, including Academics Obsession have prevailed over this period. Academics Obsession serves to undercut equity. A case in point is Lewis and Diamond's (2015) in-depth study of Riverview High School, a diverse US school overtly committed to serving all of its students. Despite the espoused goals of equality, 90 per cent of Whites end up in four-year universities compared to 50 per cent of Blacks, and Latinx[2] students. Lewis and Diamond found that 'It is … in the daily interaction (read culture) among school policy, everyday practice, racial ideology and structural inequality that contradictions emerge between good intentions, and bad outcomes' (p xix).

On a larger scale in higher education, both Kirp (2019) and Tough (2019) found massive subtle and blatant barriers for minorities, from the time they might have contemplated post-secondary education through admissions, all the way through their experiences until they 'didn't graduate' (only 40 per cent graduated within six years).Tough concludes that higher education that presumably sets out to be a 'powerful engine of social mobility' ends up functioning as something closer to the opposite: an obstacle to mobility, an instrument that reinforces a rigid social hierarchy and prevents them from moving beyond the circumstances of their birth' (2019, p 19–20).

higher education that presumably sets out to be a 'powerful engine of social mobility' ends up functioning as something closer to the opposite

Here is one more example of how insidious the barriers are. Linda Nathan (2017) was the founding head of the Boston Arts Academy, a secondary school committed to preparing disadvantaged minority students for university. Many did graduate and went to university, where they then encountered various non-academic obstacles (lack of support, bureaucratic subtleties, and the like) that resulted in a high drop-out rate. Nathan (2017) provides the bridge to our 'right driver' when she laments: 'what all the talk about grit seems to miss is the importance of putting children's experience front and center. … When the emphasis on grit ends up as a stand-alone pedagogy, the context of a student's life and family circumstances is ignored' (p 76).

Testing

As we move through the Academics Obsession phenomenon we must explicitly address the role of testing. Compounding and reinforcing the dismal current system is how the 'external assessment of learning' powers Academics Obsession (grades, advanced courses, external tests). Testing is not an instrument for improvement when it is combined with high-stakes punitive accountability. People are rarely motivated by being judged, and impossibly so if the judgement does not contain possible lines of solutions. Jal Mehta from Harvard nailed this problem (2013) in his *The Allure of Order*, drawing the conclusion that 'standards and accountability are a weak technology to produce the outcomes policymakers seek. Improving teaching and learning requires the development of skill and expertise; simply increasing expectations (even when accompanied by evidence) does little to bring about results' (p 7). I won't continue to flog a horse that I wish was dead, but for a more comprehensive and detailed review see Daniel Koretz's (2017) *The Testing Charade.* The subtitle of his book says it all: 'Pretending to Make Schools Better'.

Some jurisdictions have tried to combine testing with strategies that address teacher skill and expertise necessary to get better results. This can work on a small scale where some schools, not doing very well, learn from others that are being more successful. Because there are a few successful jurisdictions (sometimes called 'positive outliers') it can give us encouragement. This, however, is truly a case of 'exceptions' proving the rule. At the end of the day the rule – high-stakes standardised tests that become ends in themselves – will always come to dominate, because it takes such heroic effort to overcome it. It will never get to scale.

Let's take Australia as a case in point. Since 2008 Australia has had a national program called NAPLAN (National Assessment Program: Literacy and Numeracy) with annual tests at Years 3, 5, 7 and 9. For the past dozen years schools, on the whole, have shown little or no improvement (I would argue for reasons directly related to the wrong drivers). In 2019 the government commissioned a prominent team of researchers to conduct

a review and make recommendations for improvement. The researchers, staying within their mandate, recommended that the tests be made in Years 3, 5, 7 and 10 (the latter preferred over Year 9), and be extended to include science literacy (McGaw, Louden and Wyatt-Smith, 2020). Such tinkering with the system reinforces my point: preoccupation with academic (NAPLAN) scores will narrow the curriculum, without addressing the motivation of students or those that teach them.

Fortunately SAT and ACT tests are now losing favour, as more and more tertiary institutions are seeking more qualitative criteria for admissions.

The same issues continue to face students in the US, England and other jurisdictions. Asia is more complex. By and large they have been successful in the academic domain but, as I noted earlier, **at a price**. One could say that their cultures enabled more Academics Obsession, but they too recognise the limits with more anxiety, stress and the kind of dysfunctional intensity that Markovits (2019) described in the 'meritocracy trap' about the US (see also Ng (2016) on Singapore). When you add the matter of high-stakes narrow entrance tests to post-secondary institutions (such as SAT [Scholastic Aptitude Test], and ACT[3] in the US), Academics Obsession completes the assault on equity and meaningful learning. Paul Tough's (2019) chapter 'Fixing the test' is a horror story of distortion, as students and parents seek expensive tutors, and other means for getting higher scores at all costs, in order to gain access to select universities. Even one of the tutors whose livelihood depended on such students seeking his services told Tough that he tells colleges the opposite, namely, 'downplay standardised tests in favour of more nuanced evaluations of students' ability' (p 103). Fortunately SAT and ACT tests are now losing favour, as more and more tertiary institutions are seeking more qualitative criteria for admissions.

Australia has the same problem. There exists a ranking based primarily on Year 12 assessments called ATAR (Australia Tertiary Admission Rank) which does indeed rank all prospective students with a number that influences admissions. Professor Sandra Milligan and her team at Melbourne University wrote a paper called *Beyond ATAR: A Proposal For Change* (O'Connell, Milligan and Bentley, 2019) in which they argued that ATAR favours narrow academics, while overlooking other qualities that could assess the learning potential of students (such as credentialling, learner profiles and the like).

When the stakes are so high some people will do anything to game the system including cheating, and illegal behaviour. Then there is the collateral damage of narrow curriculum, high stress, and the abuse of privilege. If you bundle all of this together as Andy Hargreaves (2020a) did in a recent review of large-scale assessments, you find that 'high-stakes testing', and even mid-stakes testing, encounter a series of problems that undercut the improvement agenda, and the efficacy of the assessment.

To sum up:

1. Academics Obsession preempts a better learning agenda, whether at K–12 or a higher education, leaving most students out of the game;
2. even those who are 'successful' are not well served;
3. the most important education goals (such as the set of global competencies I shall shortly introduce) are barely addressed;
4. the strategy of assessing outcomes *per se* hardly ever leads to improvement; and
5. we need a system that streamlines external assessments while retaining the ability to monitor the system with better measures of engagement and performance.

In short, we need a new primary driver!

Wellbeing and Learning

In our ever-complex and contentious world we can no longer afford to separate wellbeing and learning. For one thing wellbeing is learning. As complexity in the world has evolved, Wellbeing and Learning represent an integrated concept. You cannot be successful on one without the other. They feed each other in a way that success begets success. As we will see, advances in the neuroscience of learning favour the seamless integration of the two elements. All of this augurs well for the point I made earlier, that wellbeing is far more than the absence of ill-being.

One key reason that Wellbeing and Learning should be a strong right driver pertains to what I called above *intrinsic motivation*. Academics, at least at the beginning, is an extrinsic motivator – a means to an end. As complex and as challenging as life has become, it is unlikely that the **initial** attraction to learning will be academics *per se*. Linda Nathan (2017) was getting closer to the primary truth when she observed that superficial emphasis on grades and academics is not a motivator for most students.

As complexity in the world has evolved, Wellbeing and Learning represent an integrated concept. You cannot be successful on one, without the other.

By contrast, she argues a need to 'imagine a curriculum that is structured in such a way as to strengthen students' sense of self and their sense of inclusion in a supportive community' (p 142) – and then her killer conclusion.

> *It is frustrating to know that the kind of learning involved to pass standardized tests does not bolster students' sense of urgency and belonging, and there is little room for the learning that would.*
>
> (Nathan, 2017, p 158)

In sum, Academics are valuable, and Deep Learning all the more so, but for the majority of students in 2021 stressing academic learning is not the starting point.

In this section I present some of the basic elements of a Wellbeing and Learning model that will be required. The other three 'right drivers' in subsequent sections will fill in the full paradigm shift that will be essential. One of our team members is the neuroscientist and child psychiatrist

Jean Clinton. I engaged Dr Jean in a conversation about what might be the best starting definition of wellbeing. Here it is:

> *People become good at life when they feel safe, valued, and have a sense of purpose and meaning. There is a need to be engaged in meaningful activities that contribute to the wellbeing of others. In the face of adversity, being able to navigate to the resources that you need to get out of the situation – known as resilience – is an essential component. To get there one needs to identify values, goals and needs as well as personal strengths. The competencies you need to achieve this, I think are the 6Cs [more about this shortly] as long as compassion and empathy are emphasised.*
>
> (Personal communication, 2020; see also Clinton, 2020)

The current system is miles away from addressing the Wellbeing and Learning needs of students. Sociologists Jal Mehta and Amanda Datnow (2020) after considering public schools in the perspective of the last 100 years conclude that there is a 'Yawning gap between how schools are organised vs how youth learn', with the former falling woefully short with respect to

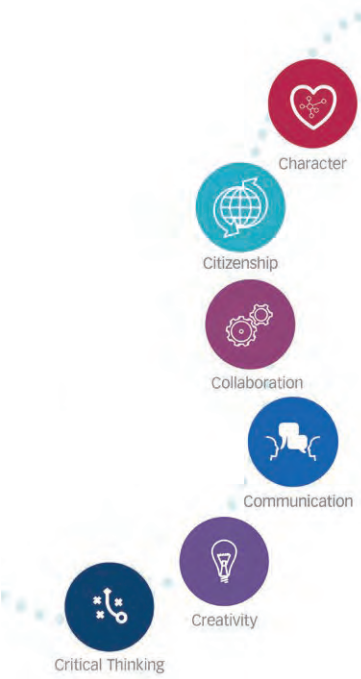
- opportunities to do work that has purpose and meaning;
- strong connections to adults and peers (relationships/belongingness);
- need to be viewed in asset-based ways;
- their identities needing to be valued; and
- their wanting the opportunity to contribute to the world.

Right Driver 1 replaces Academics Obsession with a foundational focus on wellbeing and learning. Both wellbeing and learning have suffered because of their separation. Combining them generates an interactive force that represents a powerful new **unified learning proposition** that becomes the centrepiece for contending with and transcending the growing complexities now facing humankind.

The solution must be specific, comprehensive and succinct if it is to become a viable replacement to the current system. In Kuhn's (1962) terms the solution must represent a practical alternative to the present failing system. We and others have been developing such an alternative since 2014. Essentially, the new paradigm consists of core competencies that integrate learning and wellbeing, and that provides the components for implementation, such as effective pedagogy and assessment of progress.

The Center for Curriculum Redesign (CCR) recently completed a review of the field as they analysed the curriculum from 22 jurisdictions from around the world (Taylor et al, 2020). They identified 12 competencies in total: 4 skills (creativity, critical thinking, communication, collaboration), 6 elements of character (mindfulness, curiosity, courage, resilience, ethics and leadership), and 2 of metalearning (metacognition and growth mindset). Across the 22 systems the authors found that most jurisdictions 'named' the 12 competencies in their official curriculum policy documents; about a quarter contained reference to 'progressions' of the competency; but when it came to 'pedagogy' and 'assessment' there was **zero** reference in the policy documents. Thus, the curriculum goals appeared in the policy documents but there were no pathways to implementation! In the words of the authors: 'none of the 22 jurisdictions had publicly available documents that included pedagogies (and assessments) targeting the 12 competencies' (p 7). This does not mean that there were no schools using the competencies, but it did mean that there was no 'system presence' relative to the new paradigm.

In our own work we have gone further in this direction. After seven years of development our work has been field tested, well received and covers a lot of the territory (Quinn et al, 2020). In this paper I will not compare the fine details (how



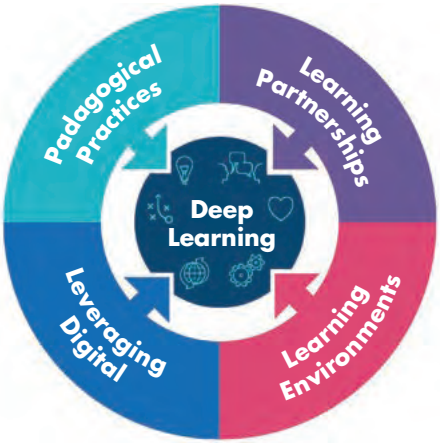
many Cs should there be, which ones, etc) except to say that CCR's framework and ours are essentially compatible.

Fundamentally, CCR and ourselves shift the main purpose of learning to *Wellbeing and Learning* with respect to how to thrive in and improve in the complex world we live in. The common elements to this new approach include.

- You need to start with and develop students' intrinsic motivation to learn in a dynamically complex world. Central to this is the constellation of purpose, meaning, belongingness, connectedness and contribution to the world. A key theme derived from this cluster of motivators is centred on 'Engage the world Change the world' – a theme we discovered by working with students; one which became the sub-title of our first book (Fullan, Quinn and McEachen, 2018).
- Deep Learning is the process of developing, understanding and using the 6 Cs, which we call the global competencies: Character, Citizenship, Collaboration, Communication, Creativity and Critical Thinking. It is worth noting that the so-called 21st century skills (the latter 4 Cs) have been around for at least 30 years; and have failed to go anywhere. Yes, the timing may have been premature, but more tellingly we have found that character and citizenship are 'foundational skills' that are catalytic to making a difference in the world – qualities not included in the original four 21st century skills, and characteristics directly related to the intrinsic motivation of contemporary students.
- The 6Cs includes developing socio-emotional and academic knowledge and skills, through effective pedagogy and assessment of progress. Our model consists of Four Elements of a Learning Design (see Figure 2): pedagogical practices, learning partnerships, learning environments and leveraging digital. This Learning Design – the four elements in combination – includes using and developing further what is known about the neuroscience of learning such as: 'student as inquirer and knowledge builder'; 'learning connects meaningfully to student interest and voice'; 'connects students to the world with authentic problem solving'; 'making mistakes and learning from them strengthens learning'; 'collaboration and other forms of connecting with other people and ideas': 'enhances neural pathways and learning', and so on.
- Such Wellbeing and Learning applies to **all** students, including a commitment to equality for all. Modern learning is quality learning that sticks with you. We also find that such Deep Learning is good for all students, but is especially good for students who are disconnected. What we need to do additionally is to partner with systems that are committed to explicitly addressing the multiple 'systems of prejudice' currently at work. The ensuing breakthroughs will be good for students, their families, and the world.

In our Deep Learning model Wellbeing and Learning are essential and inseparable. Together they are 'the right driver'. It is crucial to note that our paradigm (and that of CCR's) are comprehensive and **integrated in the same unified model**.

Figure 2. Four Elements of a Learning Design



Our NPDL model contrasts with other current wellbeing models such as Social Emotional Learning (SEL). Adding SEL is useful to a point but represents an incomplete conception of wellbeing which includes equity, and a greater sense of purpose, meaning, and connection to the world. Academic obsession is so powerful that we run the risk of 'bolting on' SEL' to improve academic performance instead of developing a single, powerful new learning system. Wellbeing and Learning must become the new foundational driver that includes greater equality, knowledge, engagement, and spiritual connection in the world.

After all, we are talking about a paradigm shift where one model replaces another. We think the conditions for doing this are becoming more favourable. As stated earlier, we are integrating learning and wellbeing – UNESCO's Sustainable Development Goals: SDG 3 (health/wellbeing), and SDG 4 (education) in a single model. Literacy (including digital and financial) and numeracy are part of basic education for everyone. Most of all we know that students and teachers (and eventually parents) love to learn and live in the new paradigm. In our 'go slow to go fast' mindset we have found that after some initial capacity building the rate of quality change accelerates.

In order for this transformation to happen teachers and students will have to shift to a new mode of learning and assessing.

Still, it is going to take a massive effort to unseat 'narrow Academics' as the primary driver, because the latter has a stranglehold on how schools are organised, what is taught currently, and how it is assessed. This obsession with Academics and related testing severely limits the possibility of major change. The shift that we are talking about will require state-level change in policy, which in turn will be more likely to happen when there are elements of support throughout the system – at the bottom, middle and so on.

A large part of the new solution consists of reducing the reliance on standardised tests and replacing them with a built-in system of formative assessment, linked to periodic summative tests on key indicators. Someone observed that when the chef tastes the soup it is formative, and when the customer tastes it, it is summative. Formative assessment concerns ideas, data and action that **improve** learning as an ongoing process; summative assessment is periodic stocktaking about how much has been learned over a given amount of time. Historically in education there has been a dearth of data about ongoing improvement. While individual teachers routinely gather information, it is not widely shared, and is not valued for the purpose of accountability. Any attempt to change that through imposition is likely to fail. With imposition, both internal development and usable external knowledge become compromised. The key to success is to have a system that monitors and intervenes to help with respect to continuous improvement. A reminder here is that these assessments encompass both wellbeing and academic learning. Thus, we have developed tools that enable the teacher to assess progressions on a rubric that ranges from 'limited evidence' to 'emerging', 'developing', 'accelerating' or 'proficient', according to the four or so dimensions that define each of the 6 Cs (see Quinn et al, 2020). Teachers use the rubric to track whether students are progressing from lower to higher embodiment of the competency in question. They can then take action accordingly. Whatever the measure, formative, continuous improvement is the driver.

In order for this transformation to happen teachers and students will have to shift to a new mode of learning and assessing. As part and parcel of learning the 6Cs, teachers and students will need to know the new global competencies curriculum well enough to assess progress reliably

and systematically. Teachers and students cannot reach a high level of thinking and action if they don't know what progress looks like. In short, the capacity of teachers and their students to validate their standards and assessment practices must be central to any suggestion that formative assessment should drive the system. Social Intelligence (Right Driver 2) will play a major role in these developments.

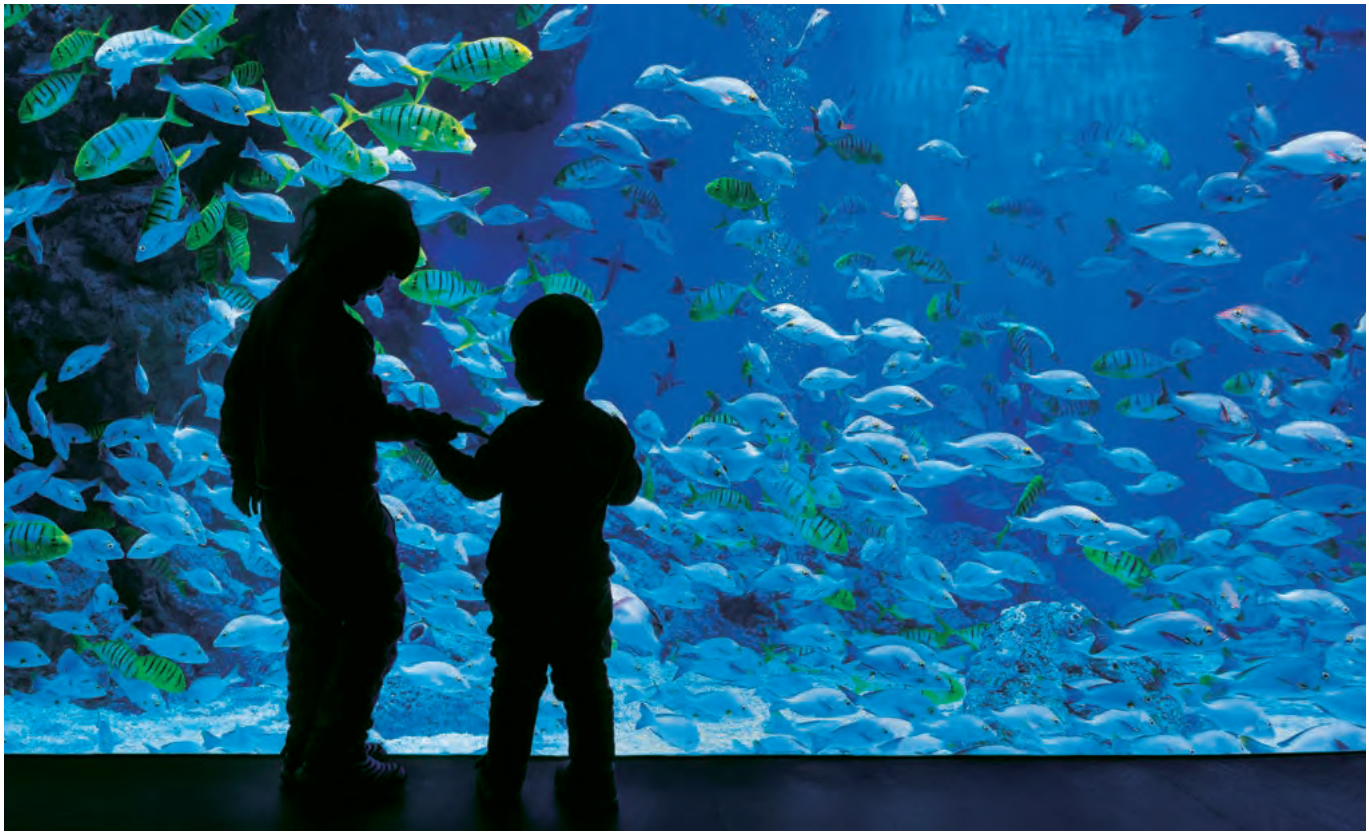
Returning to the new research and development, Sandra Milligan (2020a and b; Milligan et al, 2020) and her colleagues are explicitly engaged in these new formative assessments that focus on continuously assessing students with respect to the new competencies (as do our own assessments of progressions of learning the 6Cs, Quinn et al, 2020). At the same time, Milligan et al are striving to conduct 'outcome assessments' in the form of portfolios of credentialling progress with respect to the global competencies. Our only quarrel is that she does not include 'character' and 'citizenship', which are foundational in our framework (and we would say to the learner as citizen). Whatever the case, formative assessment focusing on 'learner profiles' and 'public displays of work', or other forms of credentialling represents a major advancement relative to Right Driver 1. Such assessment should include summative measures of 'global competencies' as outcomes, as we and others like Milligan are now addressing.

COVID-19 provides a serendipitous opportunity to rely less on standardised tests and more on formative assessment by teachers in groups.

Other prominent researchers have arrived at the conclusion that formative assessment is the driver toward better outcomes. Dylan Wiliam (2020) stresses that the focus should be on 'curriculum, pedagogy, and assessment, in that order'. In his basic textbook Wiliam (2018) describes his system as *embedded formative assessment*. The power of formative assessment is laid out in detail: clarifying and understanding learning intentions, eliciting evidence, feedback that moves learning forward, activating learners as instructional resources to one another and activating learners as owners of their own learning (Wiliam, 2018). Taken together, these elements represent a major change in most schools in the *culture of learning*. My only issue is the need to apply this thinking to the global competencies.

COVID-19 provides a serendipitous opportunity to rely less on standardised tests and more on formative assessment by teachers in groups (thereby overlapping with Driver 2, 'Social Intelligence'). In many jurisdictions, external tests by and large have been temporarily suspended. The worry is that when things settle there will be pressure to focus only on 'making up for lost ground', which lands us back in the land of Wrong Driver 1. The opportunity presents itself to revamp the assessment system in favour of formative assessment, while reducing the reliance on an external assessment system. The net effect could stimulate the motivation of learning through leveraging formative assessment, lessening early punitive actions, focusing on growth and the like. Ironically, formative assessment, well done, also serves summative monitoring and related outcomes. Overall, there must be deliberate action to create a new framework built on the four right drivers and their synthesis.

Primary Right Driver 1 brings to the fore attention and resources on Wellbeing and Learning related to the global competencies. This will be the best way to motivate students (and their teachers), and the best link to the basics of literacy, numeracy and other subjects. At the same time the focus on Wellbeing and Learning forces us to consider **all students**. We have a once-in-a-generation opportunity to attack the 'systems of inequity' that I identified earlier.



In sum, the strategy agenda consists of:

1. establishing the premise that the main strategy will stress improvement over evaluation (except in cases of malfeasance); data will show the degree of progress, or not, of all students;
2. committing to focusing on all students, especially on what I have referred to as the 'systems of prejudice';
3. widening the perspective to Wellbeing and Learning so that the focus of improvement is on the Global Competencies and learning therein, including the link to academic subjects;
4. zeroing in on the pedagogy of Deep Learning, in terms of the relative roles of teachers, students, parents and community;
5. learning from each other using what we know about collaborative learning, based on the conditions of effective group development that include: precision (not prescription), transparency, non-judgmentalism, evidence, mutual support, external networks (more about this in Right Driver 2, Social Intelligence); and
6. being a system player contributing to and learning from others in the system. Paying attention to what kinds of periodic summative evaluation would best serve both accountability and growth.

In the course of doing this, greater and more effective attention can be paid to students not doing so well. Ill-being will be addressed, but ultimately wellbeing will prevail. Disconnected students need periodic diagnostic tests (which currently exist) that especially address wellbeing, and its link to learning. Greater equity – increased performance of all students – ensues. In total, there would be a marked increase in student engagement and learning. Crucially (and a point that I will return to in the conclusion) the shift in learning that I propose will produce **students as change movers in society.**

We can now move to the bigger picture as we consider the roles of Social Intelligence vis-à-vis Machine Intelligence, and the increased Investment in Equality in the system as a whole.

Social Intelligence vis-à-vis Machine Intelligence

The working hypothesis here is that we have oversold machines, and undersold humans. Fascinating to unravel this because it is happening in real time on the very edge of civilisation. Put another way, technology has raced ahead because we failed to develop social intelligence.

Machine Intelligence

We are talking about a paradigm shift. With the fantastic development of technology all the more accelerated by the pandemic, the question is not whether major change will happen but rather what shape will it take, and will it be good for humans or not? Welcome to the vagaries of the 'uncanny valley'. As usual I start with the least preferred 'driver' of the pair. As a reminder, in each of the four sets we want the desirable driver to partner with, not destroy its counterpart. Machine Intelligence or Artificial Intelligence (AI) presents a powerhouse for better or worse. We want to end up with the potentially wrong driver (machines), working constructively with the power of the right driver (social intelligence).

The working hypothesis here is that we have oversold machines, and undersold humans

Meredith Broussard is a software developer, assistant professor at New York University, and a self-proclaimed technology geek since she was a little girl. After years of immersion in technology development she wrote a book titled *Artificial* **Un***intelligence: How Computers Misunderstand the World* (2018). She notes that 'being good with computers is not the same as being good with people'. She makes the point that 'computational systems are designed by people who don't care about or don't understand the cultural systems in which we are all embedded' (p 83). Broussard claims that when we look at the world through the lens of computation, or we try to solve big social problems using technology alone, we tend to make the same set of predictable mistakes that impede progress and reinforce inequality' (p 7). As Broussard states, 'when you believe that a decision generated by a computer is better or fairer than a decision generated by a human, you stop questioning the validity of the inputs to the system' (p 44). Political science professor Virginia Eubanks (2017) confirmed this premise in spades, when she conducted an in-depth study of two automated social services systems (one with respect to housing, and the other a child welfare agency). Here is her main conclusion.

> *What I found was stunning. Across the country, poor and working-class people are targeted by new tools of digital poverty management … Automated eligibility systems discourage them from claiming public resources that they need to survive and thrive … Predictive models and algorithms tag them as risky investments and problematic parents … automated decision-making shatters the social safety net, criminalizes the poor, intensifies discrimination, and compromises our deepest human values.*
>
> (p 11, 12)

Broussard stresses that there is no digital utopia: 'There has never been, nor will there ever be a technological innovation that moves us away from the essential problems of human nature' (p 8). The complexities of designing (and then 'letting') technology do our work is revealed by author Brian Christian in his almost 500-page romp through what he calls 'The Alignment Problem' (2020). Face recognition, autonomous cars, machine learning for deciding on parole cases, reward maximising, and more. Christian identifies fantastic lines of development and clearly warns that it will always be a work in progress. There is a lot that goes right, and a lot that can go wrong, but the machine does not care, although it may fix it belatedly.

Let's move directly to education. Holmes, Bialik and Fadel from the Center for Curriculum Redesign (CCR) in the US provide us with a great comprehensive account and guide to the state of play with respect to *Artificial Intelligence in Education (AIED)* (2019). They report that businesses and governments are pouring enormous sums of money into AI, increasing eightfold from 2013 to 2017, with the annual figure expected to be $6 billion by 2024 (p 136). Of special interest to us, they note that 'competencies' (think the 6Cs) 'are harder to measure than content knowledge, (so) assessments rarely focus on them' (p 12). Thus, the system tends to stay with what is easier to measure, namely with content (ie, academic subjects). The authors make the case that machines are better at: repetitive tasks; tasks that hinge on computational power; classifications; and making decisions based on concrete tasks – while humans are best at: experiencing authentic emotions and building relationships; formulating questions across scales; deciding how to use limited resources; making products and results usable for humans; and making decisions according to abstract values (p 24–25). With machines we can be still stuck with the question of relevance in relation to student motivation (recall our discussion of the 'yawning gap' between schools' subjects and what students might want with respect to purpose, meaning, belonginess and contribution to the world).

the system tends to stay with what is easier to measure, namely with content

Holmes, Bialik and Fadel review the themes and variation in the role of AI: algorithms, machine learning, supervised learning, unsupervised learning, reinforcement learning, computer-aided instruction, and so on. They then link these to education applications including: intelligent tutoring systems (ITS), grading and neural networks, along with concrete examples of these forms of learning. The authors also point to more recent extensions, which include collaborative learning, student forum monitoring, continuous assessment, AI Learning Companions, AI Teaching Assistant, and AIED as a Research Tool in the Learning Sciences. The main conclusion of the CCR researchers is that new forms of AIED are being developed every day, and give rise – at least to these authors – to emerging ethical questions.

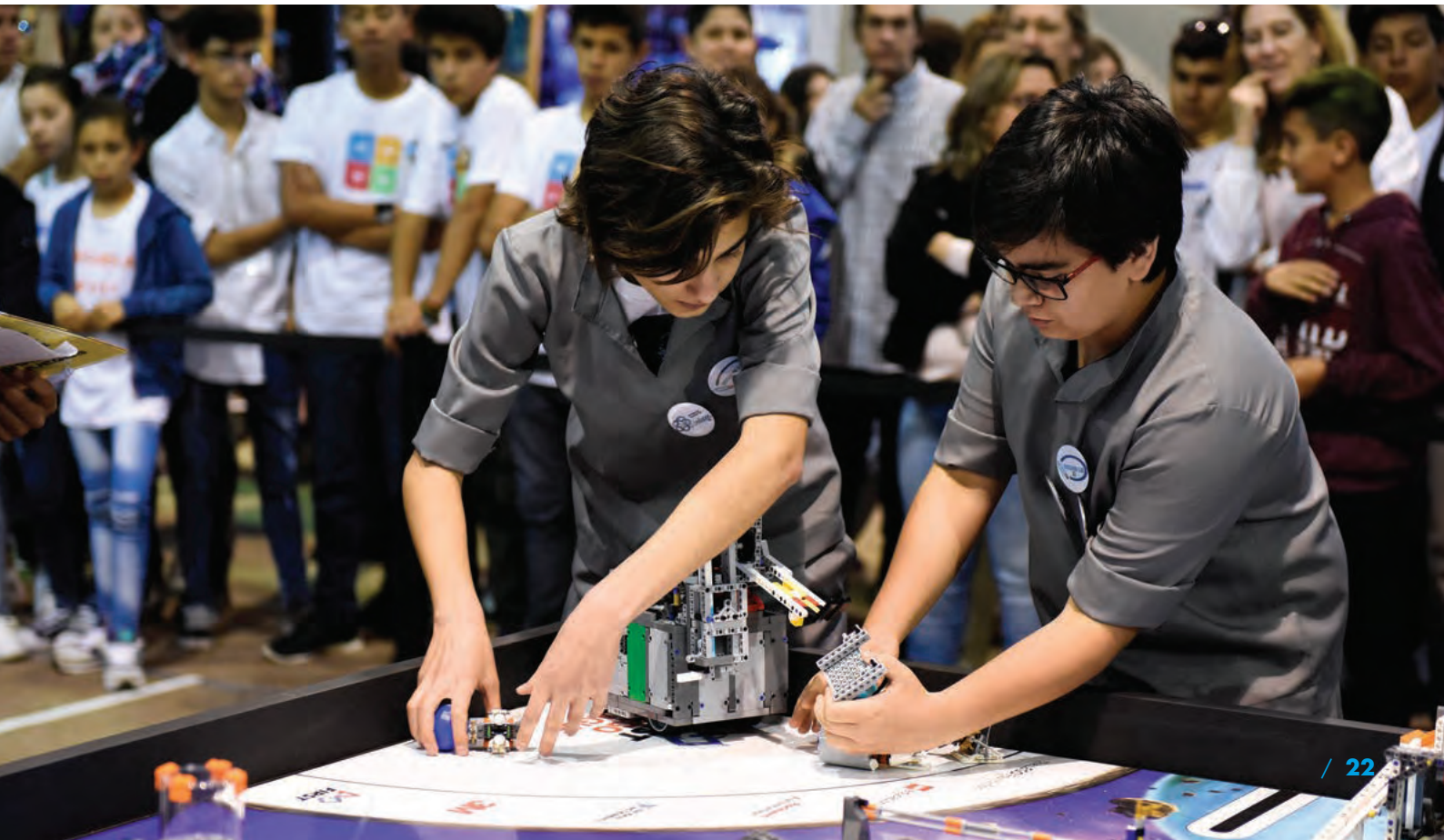
> *Around the world, virtually no research has been undertaken, no guidelines have been provided, no policies have been developed, and no regulations have been enacted to address the specific ethical issues raised by the use of artificial intelligence in education.*
>
> (Holmes, Bialik and Fadel, 2019, p 169)

To put it bluntly, AI is backed by big money and big business (Broussard called it *technochauvinistic*), has a life of its own, is magnificent in its presence and powers, but in our terms it is *bloodless*. Of course, some forms of AI do good, but overall technology is not directly controllable. The human element is underplayed. For these reasons and more, we should not allow technology to be the primary driver that it so easily is becoming by default.

Social Intelligence

Let's leave the machines for a bit and talk about Social Intelligence. Social Intelligence is an essential part of the new science of learning (and as such joins Driver 1, Wellbeing and Learning, as crucial to human development). I asked our resident neuroscientist, Dr Jean whether humans have an innate propensity to connect with other humans. She said absolutely and sent me a video that showed a man carrying an armload of books trying to open a cupboard door. A toddler was in the room with his mother on the far side of the room and happened to glance over at the man. The toddler then walked over to the man reached out, opened the door, and walked back to his mother without any fanfare. Brian Christian (2020) commented on the same research: 'Human infants as young as 18 months old will reliably identify a fellow human facing a problem, will identify the human's goal and the obstacle in the way, and will spontaneously help if they can, even if their help is not requested, and even if the adult doesn't so much as make eye contact with them, and even when they expect (and receive) no reward for doing so' (p 251). The original researchers (Warneken and Tomasello) note that such helping behavior is, 'extremely rare evolutionarily' (when compared to other species; quoted in Christian, 2020, p 252). As Tomasello puts it, 'the crucial difference between human cognition and other species is the ability to participate with others in collaborative activities with shared goals and intentions' (quoted in Christian, 2020, p 252).

Humans are born to collaborate but then socialisation occurs, whereby they may become isolated, get locked in with a given group, or flourish in cooperative endeavours with others. Out of this comes the power of the group, for better or worse. A key intervening variable is trust. We find a large-scale worry in Putnam and Garrett's (2020) longitudinal study of the evolution of 'I-ness', and 'We-ness' in the US (we will return to this in the conclusion of the paper). They found, for example, that in 1960, 58 per cent of people reported high 'social trust', compared to 2010 when social trust had collapsed (their word) to 33 per cent. With such a trend social intelligence (working with others to solve complex problems) becomes fundamentally weakened.



In any case, Social Intelligence is the propensity to work with others to achieve common goals. In education, arising from an individualistic tradition, various forms of collaboration began to occur over time but, by and large, these early forms tended to be superficial (not, for example, changing the culture of the school, let alone the profession). In short, the social intelligence of the group and individuals within have not been well cultivated in the evolution of learning.

In the past decade we have seen some stronger forms of teachers working together with greater focus and outcomes. For example, John Hattie and his group focus on what they call 'Visible Learning', examining teacher practices as they affect student learning outcomes (Hattie and Smith, 2020). It took them a while to get around to teamwork, which they labelled 'collective efficacy'. They calculate effect sizes of different practices as they relate to student learning. They suggest that an effect size of around 0.40 is statistically significant but not very powerful. Most of their 250 or so findings are below 1.0 (use of formative assessment comes in at 0.9, which is quite high). When they turned to assess collective efficacy they found at 1.57 the highest effect size of all, much larger than all others. The key question is what constitutes or causes efficacy. Hattie and group found four factors, which are

In short, the social intelligence of the group and individuals within have not been well cultivated in the evolution of learning.

- a shared belief on the part of teachers and school leaders that they could produce results;
- 'evidence of impact' as the basis for the belief;
- a culture of collaboration to implement high-yield teaching strategies; and
- a school leader who participates in frequent specific collaboration.

These are specific factors and amenable to putting into practice. They reflect the social intelligence of the group.

Another positive example from one of the leading researchers is the work on 'collaborative professionalism' from Andy Hargreaves and his colleague Michael O'Connor (2018). Studying 7 networks of professional learning from around the world, they highlight three factors, which are

- 'collaboration embedded in the culture and life of the school;
- educators supporting each other as they tackled challenging work; and
- collaborative work that is inclusive of the culture of the students and the community'.

All of these examples are based on strong social intelligence, which gets baked into the culture of schools, new networks and the system itself.

More broadly, collaboration is seen as more and more valuable. The OECD's 2018 Teaching and Learning International Survey (TALIS) survey of teachers across many countries makes numerous references to the value of collaboration among teachers. Recent work from Victoria extends the nature of social intelligence in a report, *Unleashing the Power of the Collective* (Singhania et al, 2020) – a study of 50 schools serving disadvantaged schools in networks called the 'Connection'. Evaluation data show gains in student engagement, student learning and development, STEM-related learning, student voice, metacognition and general capabilities. A further example from the same group extends the application of social intelligence to potential system change (Bentley and Singhania, 2020). In addition to finding that focused networks accomplished more, the authors also uncovered that they paid more attention to 'alignment with system priorities and engagement with a diverse range of actors' (p 7) – a point to which I will return in considering Right Driver 4 on Systemness.

All of these examples should be seen in the context of social intelligence as strong or weak; and/or in terms of effectiveness or not. Whether you think that humans are born with a tendency for strong social intelligence in the service of good, it doesn't matter. The fact is that it can naturally be mobilised for the good. The problem is that Social Intelligence, compared to technology, has been significantly **underdeveloped**. It is the weakness of the right driver, not just the strength of the wrong driver that is the source of the problem.

There is a big issue looming – machines and their AI. We have already seen that machines are not as great as some people think they are, but they can be intimidating as we face their colossal computational power. We have overestimated machines and underdeveloped social intelligence. When we look more closely, could it be that machines are not as sophisticated as we think they are, and humans are not as smart as they could be? I wonder what would happen if we actually believed that and acted accordingly? What a fantastic premise to work from! This is the potential power of Right Driver 2.

Rosemary Luckin is Professor of Learner Centered Design at University College London. Her book is aptly titled, *Machine Learning and Human Intelligence* (2018). She starts by saying 'I am concerned that our obsession with measuring and simplicity is robbing us of our ability to think and decide for ourselves what is of value. In particular, it is leading us to oversimplify and undervalue human intelligence, and to value artificial intelligence inappropriately' (p 2). She might as well have said, 'don't give such credence to Wrong Drivers 1 and 2 as you strengthen their Right Driver counterparts'. I like her challenge because she basically says that we have not done our part as humans.

We have overestimated machines and underdeveloped social intelligence.

In particular, we have failed to develop our social intelligence relative to the broader agenda of what kind of education do young people need for the rest of the 21st century. Luckin is basically saying that humans are failing to live up to *their* potential. The education system we currently have does not do justice to our evolutionary better selves.

We are overly impressed by machines, says Luckin, because we 'undervalue what it means to be human rather than being a real reflection of the intelligence of the technologies' (p 62). She then offers that there are 7 elements of intelligence, only one of which is academic intelligence. The other 6 are: Social Intelligence (social interaction capabilities); meta-knowing (knowledge about knowledge); metacognitive intelligence (regulation skills); metasubjective intelligence (recognising our emotions and the emotions of others); metacontextual intelligence (physical environment); and perceived self-efficacy (evidence-based judgement about ourselves) (p 65–66).

Luckin says that AI is brilliant at performing the routine cognitive skills of knowledge acquisition (the first element of the 7). AI can help humans increase the sophistication of their intelligence, but 'cannot themselves produce the rich repertoire of intelligence available to humans. This is mainly because AI does not understand itself, cannot explain or justify its decisions, and has no self-awareness' (p 91).

Luckin recognises that educators' lives are going to change in significant ways, 'not because their roles are likely to be automated away, but because they will need to teach a different curriculum and probably teach in a different way' (p 95), (such as teaching the 6Cs, and related pedagogies and assessment). We will need to teach 'beyond the routine cognitive processing of academic subject matter to

encompass all elements in the interwoven intelligence model' (p 95). Everything we say about Deep Learning requires going beyond academic subjects. The development of Social Intelligence requires 'that educational and training policies provide appropriate opportunities for social interaction to help students build an advanced knowledgeable understanding of the world' (p 101).

Luckin stresses that 'the beauty of using AI (for best acquiring academic knowledge) is that it means that our human educators can focus their attention upon the remaining six elements of our intelligence' (p 121). Also, 'it is technically straightforward to develop AI to teach academic, interdisciplinary knowledgeable understanding and skills, including the provision of continuous assessment about each individual's progress toward each goal. The use of such systems would free our human educators to focus on the holistic development of their students' interwoven intelligence' (p 125). A caution here: I think Luckin has overstated the case. The learning of academic knowledge and skills via machines is not so 'technically straightforward'; it still requires good pedagogy built into the design, with teachers organising and augmenting AI learning. Her main point, however, remains. AI can help teachers in major ways, take some of the burden off them, and do some things more efficiently and effectively. In this sense what we have learned in the pandemic about the potential of technology can be put to good use to accelerate learning. Furthermore, Luckin's main message is that we need to find better ways to recognise and develop (our) human intelligence way beyond the power and potential of AI (p 139).

Everything we say about Deep Learning requires going beyond academic subjects.

The last time there was a careful analysis of 'the race between education and technology' the machines won. Claudia Goldin and Lawrence Katz (2008) from Harvard carried out what is now considered a classic study covering 1900 to the early 2000s. They document how the first three quarters of the 20th century

'was an era of long-term economic growth and *declining inequality* (p 3, italics in original) – a theme that I take up explicitly in Driver 3. In other words, 'in the first half of the 20th century education raced ahead of technology, but later in the century, technology raced ahead of educational gains' (p 8). Goldin and Katz's premise is that 'human capital (our social intelligence), embodied in one's peoples, is the most fundamental part of the wealth of nations' (p 41); and in so saying they intertwine Drivers 1 and 2.

you cannot address inequality without enhancing education for all in a skills-based society. Failure to do so is why all attempts to address inequality have failed for the past 50 years.

In the 1980-2005 period (their data stop at this point, given the 2008 publication), the claim was made that technology hurt labour (at the time 'computers may have done it', some said) but the explanation, according to Goldin and Katz, 'is primarily to be found in the slowdown in the supply of skills rather than the speed up in the demand for skills.' Technology raced ahead because education stalled. The elite took the lion's share of profits driven by technology while labour wallowed.

How is the following for a harrowing observation as we contemplate our immediate future in 2021?

> *Almost all of these authors (the founders of the Declaration of Independence) wrote compellingly of the critical importance of education in a democracy to enable Americans to perform their civic functions, such as voting, and to prepare them to run for office and lead the nation* (p 135). (In the period 1900 to 1970 or so)*, the high school movement emerged from a grassroots desire for social mobility.*
>
> (Goldin and Katz, p 167)

Back to the competition: 'In the race between technological change and education, education ran faster during the first half of the (20th) century and technology sprinted ahead of limping education in the last 30 years' (1978–2008), (p 292). During the same period the income and quality of life gaps expanded dramatically between the wealthy and the middle class.

In sum, education, technology and equality are inextricably bound. Put another way, you cannot address inequality without enhancing education for all in a skills-based society. Failure to do so is why all attempts to address inequality have failed for the past 50 years. Technology won the first race because we were not paying attention. The point of the right drivers – *all four of them* – is that we have the opportunity to set up the competition more deliberately. This time, education, more specifically learning, will be a deliberate player, and the outcome will be different. With the power of technology greatly enhanced since 2008 when Goldin and Katz published their book (the iPhone was invented in 2007), machines can become a much more powerful ally if we get the sequence right (social intelligence leveraging digital). In this scenario there will be cowinners: learning, technology, equality.

As far as Right Driver 2 is concerned, we have vastly underdeveloped our Social Intelligence. Machines are not the enemy; we are! Several authors have drawn a similar conclusion, expressed here by Broussard (2018): 'humans plus machines outperform humans alone or machines alone' (p 175).

Now to our third pair of drivers. Resources play a big role. So far they have not operated in a way that favored balanced development.

Equality Investments vis-à-vis Austerity

Almost 250 years ago Adam Smith wrote *The Wealth of Nations* (published by Penguin in 1999; originally published 1776) in which he offered the concept of *the invisible hand*, as a metaphor for the unseen forces of self-interest and freedom of production combined with consumption, which would regulate supply and demand without government intervention. It turned out that somewhere along the line the invisible hand fell asleep while the privileged (owners and shareholders) took control of profits, thereby grossly distorting the market in their favour, eventually reaping the lion's share of profits compared to labour (workers), and the middle class. As usual with the drivers, we will start with the 'wrong' one – Austerity for the masses in the midst of extreme prosperity for the very rich.

Austerity

Each of the first two wrong drivers blocks equality at every turn; the third wrong driver – Austerity – seals the deal. In the past 40 years the rich have been able to reap massive percentages of profit, while most others suffer under the guise of the *gross domestic product* (GDP), treated as an indicator of societal growth. The consequence as we shall see, is that the majority of people experience greater and greater austerity. It took three women economists to expose in great detail how this happened: Heather Boushey (2019), Mariana Mazzucato (2018) and Kate Raworth (2017). The findings in their three books can be used as a springboard to our third driver (see also Andy Hargreaves, 2020b).

We could fill pages of detail about what has transpired financially since 1980. For example, in the US with respect to relative incomes of the rich and the poor (and increasingly the middle class who have fallen considerably), there is a range of indicators documenting the growing gap, and how it happened. Between the end of World War II and the late 1970s most people's quality of life grew in line with overall output growth. Then it changed dramatically, and with growing intensity, from about 1980 to the present and still going. Between 1980 and 2016 the bottom 90 per cent of income earners experienced income growth that was slower than the national average. For example, workers in the fortieth percentile have seen their incomes grow by 0.3 percent per year from $26,400 to $29,800. In the same period those at the top 0.1 per cent saw their post-tax income quadruple since 1980 (Boushey, 2019, p 5).

Key to understanding the dynamics of the differential growth, says Boushey, is 'seeing how trends of income, wealth and mobility interact' (p 24). Higher income can be saved in stocks of wealth, which in turn makes investments possible that yield

ever more wealth. Those continuously losing ground become cut off from advantages that could boost their future earning power. Another way of expressing the distortion is through GDP (the size of the economy adjusted for inflation). Between 1975 and 2017 the real US GDP tripled from $5.49 trillion to $17.29 trillion (Mazzucato, 2018, p xiii). The impact on inequality is profound, because most of the gains go to the very rich. One obvious indicator is that upward mobility (earning more than your parents and related quality of life) plummeted for those in the lower middle and working class born since 1980. Boushey (p 23) quotes Chetty as follows. 'In the past we had much more equal economic growth … Today much of the (income growth) goes to people at the very top of the income distribution. As a result, fewer kids across the income distribution – in the middle class and at the bottom – end up doing better than their parents did' (Boushey, p 23).

Lack of means and the intersectionality of systems of discrimination have made it virtually impossible for most people to escape their situations of initial disadvantage. This is not a statement of despair but more a conclusion that money will not be enough to achieve a breakthrough.

Put another way, profits over the decades since 1980, as measured by the steady growth of GDP, (the recession in 2008 not-withstanding) have systematically gone to capital (the rich) not to labour (the workers, and middle class). Dramatic advances in technology, for example (initially funded by governments in many cases), have resulted in enormous profit that eventually results in more capital to companies and their shareholders, but not to workers.

We can calculate the distortion of income distribution in many different ways, all leading to the decline of society (including, as we shall see, harm to those at the top). From 1980 to 2007 the income share of the top 1 per cent expanded from 9.4 per cent to 22.6 per cent of total wealth. In 2015 the combined wealth of the sixty-two richest people on the planet was about the same as the bottom half of the world's population – 3.5 billion people (Mazzucato, 2018, p 4). Mazzucato provides detailed analysis, showing that GDP contains many elements that exaggerate value and others that do not capture true value, making the case that GDP should not be the main measure of growth. The main point remains that 'the majority of countries worldwide saw rising inequalities within their borders resulting in the hollowing out of their middle classes' (Raworth, 2017). Stated another way the gap between the poor and the middle class is less than the gap between the middle and upper class. Only the very rich have prospered.

It gets worse. The rich have increased social and political power. Keeping taxes and public expenditures low becomes a priority in many jurisdictions 'as those with the most money manipulate political processes' (Boushey, 2019, p 105). Says Boushey, 'The emerging consensus is that politics and policy making today are increasingly geared to the priorities of the very rich, and not focused on the needs of the nation as a whole' (p 105).

Accompanying the money gap, but not caused solely by it, is the biggest put down of all – the almost inescapable indignity of those who are losing out (see Arnade, 2019). Lack of means and the intersectionality of systems of discrimination have made it virtually impossible for most people to escape their situations of initial disadvantage. This is not a statement of despair but more a conclusion that money will not be enough to achieve a breakthrough. There has been an explosion of literature during the Trump years attempting to capture the phenomena of divisiveness, destitution, mutual rage and growing mistrust. I won't review it here. In the conclusion I will come back to

the question of whether the 'right drivers' can help reverse history.

In the meantime, we know for sure that Austerity for the masses and largesse for the very rich is one bad driver.

Equality Investments

Right Driver 3 – Equality Investments – is essential for the future of society. The principle is that new investments should be targeted to the infrastructure, and in relation to resources and capacity of people at the middle and lower ranks. It is recognised and accepted that the financial deficit would increase in the short run (noting also that interest rates are extremely low). One could also express it differently. The current education system is not working very well (lots of unmotivated and unfulfilled students, for example). As such it represents a poor financial investment; it lessens the life chances of scores of young people, and costs society massive money both directly (health, welfare, incarceration), and indirectly (lost income and expenditure). A new system, based on the four right drivers, would be more costly in the short run, but would soon pay back society with increased productivity (just like it did in 1950–1980 in the US, when equality and prosperity stimulated each other).

The particular proposals must have a ring of sensibility and coherence, and therefore cannot be a laundry list of 'give us money' for this and that. They must be plausible and even predictable that they will be smart investments: producing social and monetary benefits to the system in the foreseeable future. There must be an explicit commitment to serve all students underscoring anti-racism, and anti-classism – all of which is easier to do when the four right drivers are working in concert.

The above line of thinking leads to the following kinds of investments.

1. Coordinate the first two right drivers as a set: Wellbeing and Learning, and Social Intelligence. The current education system flat out does not work. Change the paradigm to one where education will motivate hordes of learners and educators to put in the effort to get results – driven by intrinsic motivation held by individuals and groups.
2. Leverage the new modern economists' paradigm that deficits are essential under certain circumstances. Make sure that you do not just advocate the idea, but that you are committed to quality implementation. Below is the probable list of 'what's worth going into debt for' on the way to greater more stable prosperity.
    a. Provide universal access to high-quality childcare and preschool, including health care.
    b. Establish statewide paid family leave programs.
    c. Invest in quality public schools, based on the Wellbeing and Learning and Social Intelligence models outlined in Drivers 1-2.
    d. Make anti-oppression of designated groups a priority.
    e. Invest in the quality of the teaching profession with respect to all schools and age levels with 'social intelligence' (teachers collaborating for better results) at the centre.
    f. Invest in parent–community school partnerships for best learning.
    g. Connect to broader networks locally, statewide, nationally, globally.
3. In the larger economy, as Raworth states it: 'Don't wait for economic growth to reduce inequality because it won't. Instead create an economy that is distributive by design' (p 148).
    a. Provide universal health care.
    b. Revamp income tax and distribution.
    c. Establish 'a universal basic income' plan.
    d. Devise new measures of economic growth and prosperity beyond GDP.
4. Generate ideas from the middle and the bottom. Evolution is relentlessly bottom up; don't wait for the top (see Wilson, 2014).
5. Exercise leadership beyond your borders. We need international leadership to implement the four right drivers. Global partnerships will be essential.

These recommendations are obviously enormously complex. If implemented well in relation to the other three drivers, the above investments, over the period of a decade and more, will yield major economic and social benefits to society and to overall global wellbeing. Fortunately, the analyses by the pro-investment economists are beginning to provide careful guidelines for action (In the conclusion I will add to the latter via the recommendations in Mazzucato's (2021) bold proposal in her new book, *Mission Economy: A Moonshot Guide to Changing Capitalism*). We will have to invest in the high-leverage elements and monitor them carefully. The proof will be in the pudding, with adjustments as the patterns unfold. The components of the new economy are momentum makers. They should follow our knowledge about compound change: go slow to go fast. At the beginning initial difficulties will be formidable, but at some early point the effect of the four driver-related forces begin to kick in, and new patterns create accelerated momentum. The pandemic makes matters more difficult but, ironically, may have lifted some weight off what is clearly a dysfunctional education system. The four drivers could be the perfect elixir for post-pandemic prosperity.

One interesting final point of intrigue: Chrystia Freeland is a Canadian journalist, writer and politician. She is currently Deputy Prime Minister, and Finance Minister in the Liberal-led government of

Canada. Freeland published a book in 2012 titled *Plutocrats*. She described in detail the rise of billionaires and other super-rich around the world since the late 1970s (a development that we are now familiar with). Freeland further documents how the system was increasingly rigged in favour of the rich (for example, between 2000 and 2006 laws increasing regulation of finance had just a 5 per cent chance of passing, while laws that deregulated were three times more likely to pass) (p 222–223). What is striking is the nature and amount of argument by financiers that the system was *right and just*! Freeland quotes, by name, arguments such as: 'the low-skilled American worker is the most overpaid worker in the world'; 'trust us to regulate and redistribute our way back to prosperity'; 'my money isn't going to be wasted in your deficit sinkhole'; 'it's the top 1 per cent that probably contribute more to making the world a better place than the 99 per cent' (all quotes from Freeland, Chapter 6).

economic equality is not the only issue; equally if not more daunting are the 'systems of inequalities' concerning colonial, race, gender/sexual, class and other forms of domination.

What is most notable is not the hubris of the winners, but their brazenness. That was 2011. It is encouraging, I guess, that a decade later we are less likely to hear such trash talk, and more likely to hear from some of the rich that there may be a problem. Also, there is the more fundamental problem that I mentioned before: economic equality is not the only issue; equally if not more daunting are the 'systems of inequalities' concerning colonial, race, gender/sexual, class and other forms of domination. We need additional steps that will mainline reducing discrimination as the target. We could state this another way: economic equalities will always exist as long as other forms of discrimination remain. We need a double-barrelled approach that encompasses both money and fairness. Economics by itself will not bring the solution. We need the first three drivers integrated, along with an explicit push to change the system. This is why I call Driver 4 a meta-driver.

Systemness vis-à-vis Fragmentation

The fourth pair of drivers is the only one of the originals that has survived from the 2011 set – sort of. The original pair was called: Fragmented vs Systemic. Now we have Fragmentation placed in a new light, and Systemness replacing systemic. Systemness is a mind-and-action stance, whereas systemic is an analytic term.

Fragmentation

Fragmentation means piecemeal, ad hoc, unconnected, splintered. There are two ways in which this may not be a bad thing in certain circumstances. One is if the system has a dysfunctional model, or is otherwise on the wrong track. If the system is impositional and wrong, fragmentation can represent degrees of freedom – obviously not a bad thing. Second, if the system is not able to work on all four drivers as a set, it may be useful to work on one or two of them in the short run, and/or to help make a previous wrong driver more supportive. Maybe the Academics-Obsession model can be improved by new curriculum developments, by altering the structure of secondary schools to allow more individual or small group work and so on. Or new curriculum might be needed. If the current curriculum content is a barrier to all or some students, then removing that barrier would be important on the way to building the right system. We could think of scores of ad hoc changes that might be valuable even if more systematic change was not possible in the short run. So partial changes should be encouraged if they do some good, especially if they build the pressure for additional breakthroughs.

since we already know that the education system has been less and less successful since at least the turn of the century there is little credibility in the stance that we need not change the system.

Mostly, however, I would venture to say that large swaths of teachers, parents, students, advocates – you name it – find that on any given day *the system* may not know what it is doing. Indeed, many would claim that there is no system at all that is at work. There are standards over there, assessments over here; teacher appraisal in another box; communications that contradict each other, and so on. Does the right hand know what the left hand is doing? Are the levels of the system coordinated? And what about the other constant: changeover of leaders? One might conclude that over the past 40 years the problem is not absence of change but rather the presence of too many ad hoc, uncoordinated, ephemeral (this too shall pass), piecemeal policies, programs and leaders that come and go.

In any case, since we already know that the school system has been less and less successful since at least the turn of the century there is little credibility in the stance that we need not change the system. My position in this paper is that we have such a chance now – a once-in-a-generation opportunity that we dare not miss or bungle.

Systemness

In my active work directly inside system change (since 1997), I have been all over the map – bottom up, top down, middle out, back to bottom up. Nothing works for long. In 2004 I had (I thought) the makings of a solution in a 21-page booklet that I wrote for England's Department for Education and Skills in partnership with the National College for School Leaders. The pamphlet was called *System Thinkers in Action*. In that booklet I wrote:

> *A new kind of leadership is necessary to break through the status quo ... it will take powerful proactive forces to change the existing system (to change context). This can be done directly and indirectly through systems thinking in action. These new theoreticians are leaders who work directly in their own schools … and participate in the bigger picture. To change organisations and systems will require leaders to get experience in linking to other parts of the system. These leaders in turn must help other leaders with similar characteristics.*
>
> (Fullan, 2004, p 9)

I had other good ideas, so I thought. Eight in particular were:

1. public service with a moral purpose;
2. commitment to changing context at all levels;
3. lateral capacity building though networks;
4. new vertical co-dependent relationships;
5. deep learning;
6. dual commitment to short- and long-term results;
7. cyclical energising; and
8. the long lever of leadership.

Not bad, but not good enough. Somehow a band of system thinkers, sprinkled through the levels of the hierarchy would transform the whole thing? It is time to have one of those 'I used to think, now I think' moments. Of course, systems cannot change by a bunch of leaders showing the way. The following re-formulation is forecast in a book I published with Mary Jean Gallagher (formerly the head of Ontario's Literacy Numeracy Strategy). The book was appropriately called *The Devil Is in the Details* (Fullan and Gallagher, 2020). It is time to formulate a new systemness solution in relation to the four sets of drivers in this paper. The definition here represents just such a new solution. It places the responsibility for system change equally at each of the three levels of the system – Local, Middle (Regional) and Central (Policy Level). *Systemness is to systemic what coherence is to alignment.* The latter element in each pair is rational while the former element in the twosome is *subjective*. Systemness is within individuals and groups; it is how they think, act and feel about the system. It is, if you like, within the human not the bloodless paradigm where emotions and motivation reside. Let's explore this further before I draw the main action implications.

First, 'systemness' is defined as the sense that people have at all levels of the system that they are indeed *the system*. This means they have a responsibility to interact with, learn from, contribute to and be a living member of the system as it evolves. The four sets of drivers in combination are intended to help establish this mindset. Indeed, cultivating the 6 global competencies produces graduates and citizens with this very profile.

Second, Right Driver 4 is a *metadriver*. It is above the other three – intended to coordinate and learn from the interaction between and among the drivers.

Third, the system consists of (I'll keep it simple here) three levels: local, middle, central; or if you prefer: micro, meso, macro.

Fourth, those at each level in total *are* the system. As such, they are *equally* autonomous, interdependent and responsible for what happens. They have responsibilities within their subsystem, and across the system.

Fifth, if we are to inspire people to move toward the right drivers (before the whole thing crumbles) we need to point them in the right direction. That direction means that system change cannot be only top down, nor only bottom up, nor only middle out. It turns out that the system cannot be changed without 'the system' layers all having ownership of the change. The moment that any one layer claims ownership is the moment it will fail.

Sixth, ubiquitous learning within and across levels teaches us how the system's constituent parts interrelate and work over time, and how they can be improved.

This has led us to the concept of *connected autonomy*. It is not two concepts, but a single, integrated phenomenon that fluctuates according to context. The system solution means that one has to be simultaneously connected and autonomous, adjusting to the situation. The four right drivers working in concert makes it more likely that the state of connected autonomy will be dynamically balanced in a way that favours both individuals and the group. The breakthrough idea arising from systemness is that all three levels of the system, individually and together, are essential for and have independent, and conjoint responsibility for changing the system. As the levels strive to implement the four drivers they should try to connect with others around them (within and across levels) to share the journey and learn from each other. Social Intelligence means expanding connected autonomy laterally in one's own layer, and vertically to the other two layers.

The breakthrough idea arising from systemness is that all three levels of the system, individually and together, are essential for and have independent, and conjoint responsibility for changing the system.

Systems thinking in each level means focusing on the way the constituent parts interrelate, and how the system works over time. The policy level may set the direction in conjunction with the other two levels, but the successful journey must be both independent and shared. At the end of the day you can always fall back on your own (and your group's) autonomy; but if you do not strengthen within-group connection and cross-level rapport, you will not be able to achieve system change.

A lot of system change fails because people talk about and visualise change in isolation, without accepting the responsibility for the personal work, action, and learning that must accompany it for success to be possible.

In Wrong Driver 3, economist Mariana Mazzucato laid bare the deadly long-term consequences of prolonged Austerity. I identified several alternative solutions from Mazzucato and others in Right Driver 3, Equality Investments. Now Mazzucato (2021) has become more assertive in her follow up book. The book has not been released yet, but I was able to access an interview with her (Giridharadas, 2020). It is clear in the following quote that Mazzucato knows something about system change, and systemness itself:

> *My goal is to create change. But change doesn't happen if you're just campaigning for it or if, on the other side, you're just theorizing about it. And there are very few organizations, in my experience, that are places where you both have thought leadership, like real thought leadership – like changing how the textbooks are written – and have the patience and the humility and the empathy, because you need to know how to listen. You need to know how to actually work over a long, patient period to sit down and help change makers carry it out. It's easy to preach. There are many preachers of what the good thing is to do. There are few who sit down and do it.*
>
> (Giridharadas, 2020)

As a wrap up metadriver we need systemness activists who are leading and cajoling their peers, and those at all levels of the system. Both power and persuasion will be required. The good news is that we are hearing calls for system change as much if not more from the bottom and the middle as we are from the centre. It is crucial that people stay the course; systemness means understanding and influencing system dynamics over time.

Wise leadership at the top will realize that their role is as a major resource, and thought leader for system change and its right drivers, rather than being a fixer and enforcer. If they follow the recommendations in this paper, they will find that students, including very young ones, are the most powerful changemakers of all.

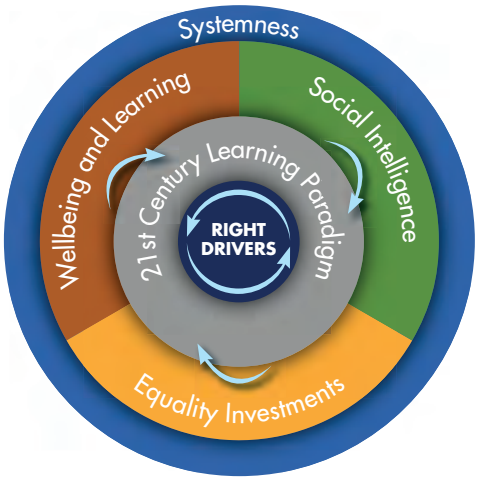
To change a paradigm

If you want system change you have to *change the system!* Tautologies aside, it is an important reminder. Also, remember the nicknames of the drivers as they represent the battleground of humanity's future: selfish, careless, ruthless, inertia, essence, limitless, dignity, and wholeness.

If there is one general guideline it is this: take stock of each of the four domains and decide where to start. Remember that Right Driver 4 is a metadriver, so always double back and consider how this driver is interfacing with the other 3. Figure 3 is your agenda.

Recall Thomas Kuhn (1962). He argued that 'paradigm shifts' (alterations in the principles that govern models of thinking and action) occur under two conditions. One requirement is that the current model is patently no longer working. In societal terms – climatological collapse, extreme inequality, rapidly declining social trust, deterioration of mental and physical health – there is no case to be made that we can rescue ourselves without new dramatic action. Education itself mirrors society. Currently schooling represents a colossal underuse of resources. The decline on both fronts (society and education) has been operating for at least 50 years and is rapidly worsening.

Figure 3. The Drivers



Kuhn's second requirement concerns the presence of a viable alternative. The four right drivers in combination represents such an alternative. Ever since Machiavelli's *The Prince* (1992, first published 1532) we have known that power struggles initially favour the status quo, because those leading 'the new order of things' are opposed by those in power, who benefit from the status quo, and those potentially in favour of the change are 'lukewarm defenders', partly because they are opposed by powerful forces, and also because 'they do not readily believe in new things until they have had a long experience with them'. The goal now is to give people a new experience with the right drivers, thereby developing a system of new doers, and corresponding new believers.

The question then is, how does the new model become established as an attractive alternative? For this to happen it is best to think of the power of 'social movements' (see Rincón-Gallardo, 2020). Systems change when there are degrees of dissatisfaction at **every level** – bottom-middle-centre. Such is the power of paradigm shifts that when things seem impossible they can still have a number of potential supports beneath the decaying surface, which become breakthrough forces for change individually and in combination.

Keep in mind that the four driver pairs come as a set. They depend on each other; they stimulate and synergise. They become powerful together. In this paper I am arguing that such is the case, or can be made to be the case, right now. When the timing is right paradigm change once started can be incredibly fast (10 years, not 50 for example).

Some critical aspects of my argument appeal to (just about) everyone's self-interest, including the rich. Epidemiologists Richard Wilkinson and Kate Pickett (2019) marshal massive data that show that more equal societies 'improve everyone's wellbeing'. The evidence shows this, but so does most people's sense of danger about where the planet is heading. Raworth states it as follows.

> *… the prevailing direction of global economic development is caught in the twin dynamics of growing social inequality and deepening ecological degradation. To put it bluntly, these trends echo the conditions under which earlier civilizations … have collapsed.*
>
> (2017, p 132)

Any time the masses are experiencing prolonged, worsening, and relentless hardship, while a small elite prospers, society is vulnerable. Strategies that potentially improve the lot of most people can be attractive to all. Eventually they appeal to the sense of humanity and destiny that many people harbour. It is worth drawing briefly on studies of *evolution*. Biologist and Pulitzer prize winner Edward O Wilson (2017) reminds us that it was only when humankind became literate that they began to indirectly influence the future, through what he calls *cultural evolution*. Most of us would agree that such influence has been a combination of what is good and bad for humans – with badness being the current trend. So, in an odd way, the future depends on whether we influence the good part of our cultural tendencies.

Wilson makes the following fantastic claim.

> *Science owns the warrant to explore everything deemed factual and possible, but the humanities borne aloft by both fact and fantasy, have the power of everything not only possible but conceivable.*
>
> (p 70)

The overall effect of the right drivers in action, to me, represents a possible open-ended first step in the continuing evolution of humanity. I think this might be the domain that Luckin was referring to when she said that humans are operating well below their potential. I do not for a moment believe that things will automatically turn out for the better. The whole point of right drivers is to shape the future by drawing on our better selves, which I think evolutionarily leans toward social and cultural betterment. For reasons based on the foundations of evolution and neuroscience I think the immediate future will bend toward goodness and the four right drivers, because enough people will be attracted to, and will recognise what is good for them as individuals, is good

for us as collectivities and will build on promising trends. However, we have to get the ball rolling in the right direction. In another book, Wilson (2014, p 162) said: 'Neuroscientists … are relentlessly bottom up'. Social movements link bottom-up, middle-through and top-down forces for breakthrough change. The Four Drivers in our 'Human Paradigm' list provide ideas to help make this happen with all levels as potential instigators and partners.

I want to close by returning to Putnam and Garrett's provocative analysis of the 'I-We' trends in the US from 1890 to 2020. You will recall that they traced the evolution of America across 'I-We' periods ending the current time of excessive 'I-ness'. Place priority on the right drivers, and you will be establishing a new order where both the 'I' and the 'We' prosper in tandem; connected autonomy at its best.

Paradigms are such that they feed on their own internal momentum. If we get the ingredients right, we can expect accelerated growth and improvement.

We are currently in crisis and there is only one societal institution that has the potential to be central to the solutions, namely a new learning system founded on the right drivers. Young people in particular (whom I think of as 50 per cent a bundle of nerves, and 50 per cent wanting to change the world for the better) are the main source of future success – change makers on the move, skilled in the 6Cs led by character, and citizenship. We have not nearly invested enough in young people. In our Deep Learning work we have not found a child young enough who does not want to be a change agent. When we got deeper into the global competencies, what screamed out to us was a phenomenon that was clearly individual and collective. We immediately labelled it: 'Engage the world Change the world'. Learn and live – better and longer.

The new economic models will prove to us that equality and growth can feed on each other, if we can also address the systems of discrimination that are currently embedded. Once the new trend is started, success will beget more success. We will find that social intelligence is a major resource that we have barely developed, let alone tapped. Humans (which includes social) will be the dominant partner in the next phase because of connected autonomy. We do not have to solve all the problems in the current decade, but we have to reverse the trend by proving that equality and inclusion are part and parcel of prosperity for all. Paradigms are such that they feed on their own internal momentum. If we get the ingredients right, we can expect accelerated growth and improvement.

In addition to the persuasiveness of the argument and the impact of the four drivers it is a certainty that political forces and power will also be essential to alter the current status quo. There will be some losers, but the majority will gain, even among those who were doubtful that radical improvements could be made. Eventually, large numbers of people at all levels of the current system will need to recognize that they can be better off in a new social order.

The outcomes we can expect and need to track can be defined in micro and macro terms. At the micro level we can expect greater scores on engagement and belongingness, academic progress through to graduation, reduction of achievement gaps among subgroups, demonstrable evidence of proficiency in the 6 global competencies, greater satisfaction of teachers and school and district leaders, and more participation of parents and community members. At the macro level and taking greater time will be more mobility across generations, reduction in wealth gaps, more civic engagement, and rising social trust across society. Eventually, cooperation across countries will improve. All of this reflects the proper role for learning in complex societies – for the vast majority to thrive amidst complexity.

I used to say that hope is not a strategy. The complexity scientist, Thomas Homer-Dixon, University of Waterloo, Ontario recently published his latest analysis, *Commanding Hope: The Power We Have to Renew a World in Peril* (2020). He confirms the feeling that most of us have these days 'a creeping sense that the world is going haywire' (p 2). He then presents reams of evidence: 'accumulating scientific evidence show that key trendlines gauging humanity's wellbeing – economic, social, political, and environmental – have indeed turned sharply downward' (p 2).

> Young people in particular ... are the main source of future success – change makers on the move ... We have not nearly invested enough in young people.

Given the relentless, deteriorating conditions in our society, many people have developed a strong sense of 'learned hopelessness' – the only thing left for them is to lash out or give up. The future becomes a self-fulfilling prophecy. Most positive alternatives for the future seem to be wishful thinking, whose prospects for success seem naïve – not worth fighting for from a 'chances of success' perspective. When I look at current proposals for education reform I find them oddly unconvincing, without knowing why. Homer-Dixon provides the insight when he says many of these proposals are 'too elaborately technocratic and too blandly anodyne to truly motivate us' (p 234). Anodyne – what a great concept – offering some superficial temporary relief, but essentially bland, inoffensive, unobjectionable, innocuous. After a while we become inured to them, as they make no impact. I feel that way about equity policies in education over the last 50 years – a lot of fanfare but little impact. They become part of the hopelessness syndrome.

In light of the new right drivers' exploration, and the untapped potential (and commitment especially of youth) I sense the time has come for creating countless instances of 'learned hopefulness', knitting ideas and people together, and leveraging them upwards and sideways to establish a new order. I buy into the notion that human reason and spirit knows no limits (and in any case operates well below its potential). We know that change happens far more rapidly in the social realm. Homer-Dixon again: 'It's in our social systems not our technologies – where we more often see the dramatic non-linear shifts that are truly revolutionary in scope and implications' (p 135). Homer-Dixon posits that vague hopes are useless, but hope that has a degree of tangibility, that has a basis for concrete possibilities, has a chance to take hold. Together, the four drivers may provide us with that opportunity.

Hope grounded in concrete action is essential. Mazzucato states: 'Challenges are the big goals [that] need to be brought together in different sectors'. And then the powerhouse conclusion: 'instead of just talking about purpose and stakeholder value, what does it mean to nest purpose in a system, not just in corporations, but in a system to affect public and private work together in new ways' (Giridharadas, 2020).

Hope with 'tangibility'; 'nested purpose': In short, hope can be a strategy if it is hitched to a compelling vision that is *experienced*. The right drivers provide many opportunities for creating new instances of individual, and collective 'learned hopefulness' with others. They represent a portal through which we can enter and form a new ecosystem – one that is integrated and synergised, and which has unlimited potential. Given a massively discredited paradigm that we encounter day after day, the best way forward may be to use the four right drivers to create new realities, and pockets of critical masses, that return hope to its rightful place – as an act of will that creates a better future, rather than a function of what happens to you. If this vision takes hold, system change will occur faster than any of us could have imagined.

Endnotes

1. Merriam-Webster, via Wikipedia, provides the following definition. '**Academics** plural, chiefly US: **academic** subjects: courses of study taken at a school or college.'
2. Merriam-Webster: 'of, relating to, or marked by Latin American heritage – used as a gender-neutral alternative to *Latino* or *Latina*.'
3. Wikipedia: 'The ACT (originally an abbreviation of American College Testing) is a standardized test used for college admissions in the United States. It is currently administered by ACT, a non-profit organisation of the same name. The ACT test covers four academic skill areas: English, mathematics, reading and science reasoning. It also offers an optional direct writing test. It is accepted by all four-year colleges and universities in the United States as well as more than 225 universities outside of the US.'

References

Arnade, C (2019) *Dignity: Seeking Respect in Back Row America*, Sentinel, New York.

Bentley, T and Singhania, A (2020) *Leading Through Crisis: Resilience, Recovery and Renewal*, ACEL Monograph, Strawberry Hills, NSW.

Boushey, H (2019) *Unbound: How Inequality Constricts Our Economy and What We Can Do About It*, Harvard University Press, Cambridge, MA.

Broussard, M (2018) *Artificial **Un**intelligence: How Computers Misunderstand the World*, MIT Press, Cambridge, MA.

Christakis, N (2020) *Apollo's Arrow: The Profound and Enduring Impact of **Coronavirus** on the Way We Live,* Little, Brown Spark, New York.

Christian, B (2020) *The Alignment Problem: Machine Learning and Human Values*, W W Norton, New York.

Clinton, J (2020) *Love Builds Brains,* Tall Pine Press, Edmonton, AB.

Eubanks, V (2017) *Automating Economic Equality*, St Martins Press, New York.

Freeland, C (2012) *Plutocrats: The Rise of Global Super-Rich and the Fall of Everyone Else*, Anchor House, Toronto.

Fullan, M (2004) *System Thinkers in Action*, Department for Education and Skills (in partnership with National College for School Leadership, NCSL), London.

Fullan, M (2011) *Choosing the Wrong Drivers for Whole System Reform*, CSE Seminar Series Paper 204, Centre for Strategic Education, Melbourne.

Fullan, M (2020) *Nuance: Why Some Leaders Succeed and Others Fail*, Corwin Press, Thousand Oaks, CA.

Fullan, M and Gallagher, M J (2020) *The Devil is in the Details*, Corwin Press, Thousand Oaks, CA.

Fullan, M and Quinn, J (2016) *Coherence: The Right Drivers in Action for Schools, Districts, and Systems*, Corwin Press, Thousand Oaks, CA.

Fullan, M, Quinn, J and McEachen, J (2018) *Deep Learning: Engage the World Change the World*, Corwin Press, Thousand Oaks, CA.

Fullan, M, Quinn, J, Gardner, M and Drummy, M (2020). *Education Reimagined: The Future of Learning.* A collaborative effort between 'New pedagogies for deep learning' (npdl), and Microsoft Education.

Giridharadas, A (2020) *A Conversation with Mariana Mazzucato*. The.Ink

Goldin, C and Katz, L (2008) *The Race Between Education and Technology*, Harvard University Press, Cambridge, MA.

Hargreaves, A (2020a) 'Large-scale assessments and their effects: The case of mid-stakes tests in Ontario', *Journal of Education Change*, **21**, p 393–420.

Hargreaves, A (2020b) 'Austerity and inequality; or prosperity for all? Educational policy directions beyond the pandemic', *Educational Research for Policy and Practice.* link.springer.com/article/10.1007 per cent2Fs10671-020-09283-5.

Hargreaves, A and O'Connor, M (2018) *Collaborative Professionalism*, Corwin Press, Thousand Oaks, CA.

Hattie, J and Smith, R (Eds) (2020) *10 Mindframes for Leaders*, Corwin Press, Thousand Oaks, CA.

Holmes, W, Bialik, M and Fadel, C (2019) *Artificial Intelligence in Education*, Center for Curriculum Redesign, Boston, MA.

Homer-Dixon, T (2020) *Commanding Hope: The Power We Have to Renew the World in Peril*, Alfred Knopp, Toronto.

Kirp, D (2019) *The College Dropout Scandal*, Oxford University Press, New York.

Koretz, D (2017) *The Testing Charade: Pretending to Make Schools Better*, University of Chicago Press, Chicago.

Kuhn, T (1962) *The Structure of Scientific Revolutions*, University of Chicago Press, Chicago.

Lewis, A and Diamond, J (2015) *Despite the Best Intentions*, Oxford University Press, New York.

Luckin, R (2018) *Machine Learning and Human Intelligence*, UCL Institute of Education Press, London.

Machiavelli, N (1992; 1532) *The Prince*, PT Collier, New York.

Malin, H (2018) *Teaching for Purpose: Preparing Students for Lives of Meaning*, Harvard University Press, Cambridge, MA.

Markovits, D (2019) *The Meritocracy Trap*, Penguin, New York.

Mazzucato, M (2018) *The Value of Everything: Making and Taking in the Global Economy*, Hatchette Book Group, New York.

References

Mazzucato, M (2021) *Mission Economy: A Moonshot Guide to Changing Capitalism*, Penguin, New York.

McGaw, B, Louden, W and Wyatt-Smith, C (2020) *Naplan Review Final Report*, States of New South Wales, Queensland, Victoria and Australian Capital Territory, Australia.

Mehta, J (2013) *The Allure of Order*, Oxford University Press, New York.

Mehta, J and Datnow, A (2020) 'Changing the grammar of schooling', *American Journal of Education*, **126**, 4, p 1–8.

Milligan, S (2020a) 'School learning and life', a presentation at University of Melbourne Conference Network of Schools, May 2020.

Milligan, S (2020b) *Future Proofing Australian Students with 'New Credentials'*, University of Melbourne, Melbourne.

Milligan, S, Luo, R, Kamei, T, Ruce, S and Kheang, T (2020) *Recognition of Learning Success for All*, Learning Creates Australia, Melbourne.

Nathan, L (2017) *When Grit Isn't Enough*, Beacon Press, Boston, MA.

Ng, P T (2017) *Learning from Singapore*, Routledge, New York.

O'Connell, M, Milligan, S and Bentley, T (2019) *Beyond ATAR: A Proposal for Change*, Koshland Innovation Fund, Melbourne.

Organisation for Economic Co-Operation and Development (2018) *The Teaching and Learning International Survey*, OECD, Paris.

Putnam, R and Garrett, S (2020) *Upswing: How America Came Together a Century Ago and How **We** Can Do it Again*, Simon and Schuster, New York.

Quinn, J, McEachen, J, Fullan, M, Gardner, M and Drummy, M (2020) *Dive into Deep Learning: Tools for Engagement*, Corwin Press, Thousand Oaks, CA.

Raworth, K (2017) *Doughnut Economics: 7 Ways to Think Like a 21st Century Economist*, Chelsea Green Publishing, White River Junction, VT.

Rincón-Gallardo, S (2020) *Liberating Learning: Educational Change as Social Movement*, Routledge, New York.

Sandel, M (2020) *The Tyranny of Merit: What's Become of the Common Good*, Farrar, Straus and Giroux, New York.

Singhania, A, Hard, N and Bentley, T (2020) *Unleashing the Power of the Collective in Education*, RMIT University, Social Ventures Australia (SVA), Melbourne.

Smith, A (published by Penguin in 1999; originally published 1776) *The Wealth of Nations*, Penguin Classics.

Taylor, R, Fadel, C, Kim, H and Care, E (2020) *Competencies for the 21st Century*, Center for Curriculum Redesign, and Brookings Institution, Boston, MA.

Tough, P (2019) *The Years that Matter the Most*, Houghton Mifflin Harcourt, Boston, MA.

Wiliam, D (2018) *Embedded Formative Assessment, 2nd Edition*, Solution Tree, Bloomington, IN.

Wiliam, D (2020) 'Curriculum, pedagogy, assessment, in that order', Keynote, ASCL Annual Conference, Association of School and College Leaders, Leicester, UK.

Wilkinson, R and Pickett K (2019) *The Inner Level: How More Equal Societies Reduce Stress, Restore Sanity, and Improve Everyone's Well-being*, Penguin Press, London.

Wilson, E O (2014) *The Meaning of Human Existence*, W W Norton, New York.

Wilson E O (2017) *The Origins of Creativity*, W W Norton, New York.

Additional reading

Athough not cited specifically in the text, the following item was used in preparing this paper, and may be of interest to the reader.

Fullan, M (2020) 'System change in education', *American Journal of Education*, **126**, 4, p 653–666.

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About the Author

Michael Fullan, OC, is the Global Leadership Director, New Pedagogies for Deep Learning and a worldwide authority on educational reform, with a mandate of helping to achieve the moral purpose of all children learning.

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About the Paper

In 2011, CSE published Professor Fullan's influential paper, *Choosing the wrong drivers for whole system reform*. In 2021, he argues that the current model for education is badly out of date and now is the time to focus on identifying and getting the 'right drivers right'. He explores four wrong and four right drivers, their relative weaknesses and strengths and how to change what he regards as a 'massively discredited paradigm that we encounter day after day'. The best way forward, he concludes, is to use the four right drivers to create new realities and pockets of critical masses, returning hope to its rightful place – as an act of will to create a better future.

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