Educational fads will not save the current education system from continued decline.

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We are in an age of disruption. Widespread disruption and it's transforming many aspects of the world we know. The education of our children is one such industry which is now subject to major disruption.

Disruptive technologies change the ground rules industry operates within and places them under threat of continued existence. In most instances what is under threat is the bureaucracy and legislation which has built up around an industry, like a cancer, slowly constricting and stifling freedom and innovation. Over time this can change the simplest of environments into a complex maze of limitations and controls, the original reason for the creation of these controls long forgotten.

These environments also give birth to many reputations and fiefdoms as people cement their futures in and around the bureaucracy.

The way we educate our children, something we once took for granted, has been overrun by disruptive technologies. The impact of the disruption is visible in the ever-decreasing educational standards. Like a taxi industry that for so long thought that Uber was no more than a bad dream, the bureaucracy of education is yet to accept the disruptive changes that have already passed them by. The lack of understanding of the situation can be seen in a frantic grab for on-trend solutions or fads to save the day

and/or peoples' reputations along the way maintaining the status quo. A lack of vision and understanding has education becoming the football of competing agendas as it searches for relevance.

Education from primary school through to University has historically been based on two strategic fundamental strengths. A superiority in the teaching of "the Science of things" and ownership of the scalability and delivery of this knowledge, i.e. the breaking down of knowledge into measurable and definable blocks which can be delivered within a controlled network (schools) to an audience desperately in need of knowledge. These strategic advantages no longer exist.

The Second World War became the catalyst for the development of large scale manufacturing facilities and mass production focused on meeting the demands of war. Post war the development of the education system followed industry's transition into mass production and scalability with the product being the delivery of knowledge. The underlying environment at that time was a genuine need to lift the educational standards of all. This fitted perfectly with this production line model, satisfying the egalitarian need to deliver "the Science of things" enmasse ... The era of the mass-produced student had arrived.

Over time the motives of education moved from one of egalitarianism to one of production by numbers and quality control. 65 years down the track, with a clear majority of Australian society now well-educated, this egalitarian need has been met. Today education is now focused on commercialisation driven by numbers and the need to generate a profit or outcomes/students $.

The need for scaleability of knowledge delivered by an education production line also drove the slicing of the education system into pillars based on divisions of knowledge: Maths, Science, English, History, etc. These pillars have taken on a life and importance of their own at the expense of our children. In a world where we need to call on

teach English". There is much more knowledge to be transferred in "I teach".

The environment has now changed and disruption has come to education. Control of what knowledge is delivered and how it's distributed has been taken out of the hands of the education system. Everything that you need to know about "the Science of things", from kindergarten to University and beyond, is now available on the web. It is also available in bite size pieces ready for delivery when and wherever it's required.

Scaleability in education has become a core part of the education system's DNA but if education is to modernise the drive must now move away from scaleability and delivering "the Science of things" to be focused on producing students who will lead the nation into the future. A future which is now full of hundreds of millions of highly

educated competitors. This will require a complete rethink of the education process and a focus on lifting students above the competition rather than just lifting them to an artificially defined standard.

This drive for scaleability in education has now become a huge road block. It drags the process of education to the lowest common denominator which is where education in Australia is heading. Unfortunately, dismantling this road block will require dismantling of educational fiefdoms and bureaucracy.

The Federal Government has admitted that our education ranking has been in free fall since 2003 and even an increase of 50 per cent in funding across the nation has done nothing to stop the trend. The education revolution of the Rudd-Gillard-Rudd era failed Australia because it was based on the delivery of buildings and not the strategic imperatives which now exist in education. There was a blind assumption that if you (spend more money) give schools better classrooms they would produce better children. This is the equivalent of government giving taxi drivers better cars as the solution to fighting the disruption of Uber. It would be nice to have a new car but it doesn't solve the problem. This strategy did not work and never will.

The ABC reported on the latest Trends in International Mathematics and Science Study – an assessment of year 4 and year 8 students in 49 nations. Australia had tumbled to embarrassing levels: 28th in the world for year 4 maths…25th in year 4 science…17th in year 8 maths and science. Below that of Kazakhstan it was noted.

The education bureaucracy is struggling to justify its own value as educational standards keep falling driving a trend to jump on the next fad, band wagon or snake oil solutions in a hope to maintain the status quo: and if that solution comes from overseas then all the better. The current focus on “coding for all” is a good example of chasing fads. Industry will be the first to tell you that coding (it used to be called computer programing) is just another language and fundamentally little different from French or German. There are hundreds of coding languages used by industry and “the Science of coding” is available on the web. Just as French and German are important if you need to work in environments where these languages are useful, so too is coding if you work in an appropriate environment. So why has education chosen coding? Coding fits with scaleability. You can give all students a simple Lego robot, teach them some simple coding and you will have conformed to the scaleability of delivery, and scaleability of measurement criteria demanded by the system.

Our education system is a laggard. The rest of the Asia started focusing on teaching coding in schools 20+ years ago as a method or lifting them out of 3rd world status (to meet an egalitarian need) so we are light years behind before we even start. In Australia coding is being treated as a savior fad and not given the attention that it should, as a tool that could form part of a solution to real world problems. It is the problem-solving component of the equation that our students need to learn and not coding per say, especially coding that the students will never use again – they may as well learn

Swahili. Coding is important, but in context.

Industry have for many years been calling for a focus on the development of skills such as teamwork, communication, collaboration, presentation, innovation and entrepreneurialism. These are called employability skills because they are skills used every day in industry. It's industry's belief that if a student comes to them with these employability skills they (industry) have the capacity to teach "the Science of the job". Yet nowhere in the school curriculum are these employability skills listed as educational priorities, nor are there subjects which specifically address their development.

The current focus on STEM (Science, Technology, Engineering & Maths) education originated from industry's desire to break down the silos of education and have schools develop employability skills based on a problem-solving pedagogy. It was industry's attempt at driving change in the education process. Unfortunately, STEM has now been high jacked, via the focus on scaleability, into just more Science, more Technology, more Engineering, more Mathematics and in many cased more games. More of the same pillars driven by the same scaleability focused measurement systems. STEM is doomed to failure if the system does not realise the drivers behind its development.

The lack of focus on employability skills is highlighted by the rejection of teamwork within the educational grading process. Even though teamwork is highly sought after by industry as a key employability skill, it is shunned by the education system. The ATAR (Australian Tertiary Attainment Ranking) will not allow students to be assessed on projects that involve teamwork. Students must only work on projects which can be assessed on an individual basis. It is, however, an undeniable fact that all through life we will work in teams. Within these teams there are some people who do more than others but this doesn't stop teams achieving goals or replacing team members that don't pull their weight. This is the natural selection process within teams. Working in teams delivers a set of experiences that help to shape peoples' approach to life. And yet, students cannot submit team projects for assessment as part of their ATAR assessment. But why? Assessment of teamwork is not easily scaleable and the current system would have to move away from scaleable measureability to be able to assess teamwork and this would require change.

An education system that continues to hold as a strategic imperative its ability to deliver "the Science of things" in pillars of "bite size knowledge" has placed schooling on a slippery road to turmoil and failure. Similar avoidance of reality in commercial environments has seen them being subjected to increasing threats from disruptive technology. Not just the taxis. Manufacturing. Logistics. Retail, etc. We cannot let this happen to education.

For a solution, you only need look at what is happening in Scandinavia and Western Europe. This region has become synonymous for understanding how to educate in the modern age. These nations have embraced emerging technologies and are producing highly skilled and sought after employees. The most recent World Economic Forum's

Global Competitiveness Report which lists the world's most educated nations has Singapore at the top followed by Finland, the Netherlands, Switzerland, Belgium, Denmark and Norway.

The way people interface with situations and with problems is not scaleable in the way that "the Science of things" is currently delivered. This interface is personal, individual and in real time. Teaching people how to work through and determine solutions to problems, to see problems in another light and to develop solutions, takes guidance, patience and practise. These skills do not easily translate from the internet but they can be translated to students by good teachers.

If we are to become the smart and innovative nation that we so desire the education system must now move on from delivering "the Science of all things" to delivering knowledge and skills that exist at the interface between humans and the environment. It should be focused on teaching the human components of life and careers. Not the equations used by engineers but rather how to be an engineer, doctor, nurse etc. How to think like a designer or scientist. How to frame the problems of life and how to frame a response to a problem based on factors that are not immediately visible, and then how to use "the Science of things" to solve these problems.

A simple analogy is a high school rugby team. While the rules of the game can be delivered through scaleable systems to every coach in every school. What makes one rugby team better than the next is driven by the ability of the coach/teacher to draw on knowledge and experience to teach what cannot be learnt out of a text book or over the web. It requires real-world knowledge gained from handling real-time human to human interactions on the football field. It is this real-world problem solving knowledge that we should be seeking to transfer to our students via our teachers and why we should be seeking teachers from industry who bring to the classroom years of experience.

The importance of teamwork as a learned skill is undeniable. If you ask industry what component of a resume they look at first, they will nearly always tell you they look to see if an applicant has been involved in sporting teams, participated in Scouting, Guiding or engaged with other community groups. Students with these experiences stand above the others because they have been exposed to the teamwork and problem solving dynamic.

Another downside of scaleability is the requirement to measure students against the same bite size pillars of knowledge. The ATAR (Australian Tertiary Attainment Ranking), and for that matter the NAPLAN, are only measuring the scaleability of the education process: Have we had the most students learn the same basic principles? Neither measures the true capabilities of our children yet we use the results of both to determine educational strategies!

An argument could be made that there is now no longer a need for the pillars of education (Maths, Science, English, History, etc.) and our education system should be

providing an environment in which students can gain experience solving problems and, more importantly, focus on employability skills that industry so desperately seeks. In Finland, the performance leader in education, they have now thrown out traditional pillars of education for students over 16 years of age. After 16 no subjects are taught and all education is focused on solving problems. Problems that the students choose. They have gone away from breaking education down into bite size chunks and are building back into education that which is in real time and relevant.

While our Federal Government seeks to promote innovation as the foundation to building a smarter nation the current education system is building-out innovation not creating it. There is a realisation to be had that innovation is not scalable and doesn't come out of a soap box. Innovation happens at a point in time when self-efficacy is at its highest and is usually driven by an individual or small teams of people. It happens at the boundary layer of people and problems.

The fundamental elements that our education system should be striving to achieve include:

1. Focus on teaching a component of "the Science of things" to younger children: the bits and bytes that in days gone by came from text books – who was the first to climb Everest, what is the equation for force, what is a conjunctive verb. It should revolve this education process around engaging and inspiring students and should be taught in context with real problems.

2. School is a place to learn about people, how to socialise, how we deal others and how we work with people in teams.

3. School is a place to learn how to apply the 'the Science of things' to the problems we will face in life. This is a fundamental of entrepreneurialism.

4. School is the place to develop employability skills and for children to become outliers in the world of problem solving. Promoting independent and challenge based learning is something that all educators should cherish and foster as part of their daily teaching tasks as important.

5. Identifying those educators with a head set for this new way of teaching and provide them with the rewards that promote their willingness to lead in new directions.

Who is willing to see our dilemma for what it is? Who within government, or within our education system, has the courage to suggest that we re-engineer our national teaching methodology?

While we can to look to Scandinavia and Western Europe for new ways there are example to be followed that have existed in our own back yard for 20 years. We at Re-Engineering Australia Foundation Ltd (REA) have been implementing problems based

STEM career engagement activities focused on the development of employability skills into schools since 1998, yet we struggle for fresh air in a surf of mediocrity. Industry is certainly on board with what we are achieving. Since our inception, we have mentored over 600,000 students through these programs with outstanding success. Our programs are not based on scaleability but facilitate learning experiences at the interface between people and problems. Our reputation on the world stage for producing the best STEM students in the world is unmatched. Australia has been ranked in the top three STEM nations in the world in international STEM competitions in 12 of the past 13 years. Five times we have been ranked 1st, five times 2nd and four times 3rd.

We have been invited to implement our programs into curriculum in Canada, France, UK, Mexico, China and Greece yet we are punch drunk from trying to open doors in Australia education. Our perception is that somewhere in the process we are still fighting the ongoing belief that anything Australian can't be any good. Governments are happier to keep looking overseas for fad fixes because they don't believe that we in Australia actually know what we are doing. They are not prepared to back "Australian".

As any parent with children in year 11 or 12 it's distressing to see our children placing all their efforts on achieving an ATAR score so the system can feel good about itself rather than focusing on developing the skills which will set them on a pathway to success in life.

True change requires a realisation that there is a problem. Only then can it become a reality and when the tide of mediocrity passes and more visionaries and industry join the ranks we can eventually demand a better future for our children.

  

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