

Educating Gen Z in a digital world

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Frances Valintine is a “Futurist” thought-leader in emerging and disruptive technologies and has 20 years’ experience across business, technology, and education. In 2013, Frances founded The Mind Lab, a unique collaboration between a public education provider and a specialist education lab dedicated to digital literacy capability and contemporary practice in the teaching profession. In 2016, she launched Tech Futures Lab to navigate the new world of technology-enabled businesses. In 2018, Frances was appointed a Companion of the New Zealand Order of Merit in recognition of her lifetime of contribution to education and technology. She has won a number of awards, including the New Zealand Flying Kiwi Award, a Sir Peter Blake Leader Award, the Westpac New Zealand Woman of Influence (Innovation), and the NEXT New Zealand Woman of the Year (Education). She has also been inducted into the New Zealand Hi-Tech Hall of Fame.

Frances was invited to keynote at the ANZEA Conference to share her insights on future prospects for Aotearoa New Zealand. She

spoke about the need for our education system to be responsive to young people who have grown up as digital natives surrounded by technologies that open the world up to them. Conference participants shared that it was riveting to contemplate the responsiveness of evaluation to a data-rich and digitally defined world that young people took for granted.

People, not technology, are the best-known engine for driving innovation and economic growth. As lifespans and careers lengthen, we are preparing our students for a career “ultra-marathon”. Our role as educators is increasingly focused on fostering metacognitive skills—fit for the future of work.

It is hard to comprehend a future world where zeros and ones make many of our decisions. It is also hard to comprehend that algorithms now influence and curate our specific version of information—what we see, which data we get access to, and what research we “discover”. We are all now, in one form or another, a product of a complex algorithmic profile—our age, gender, ethnicity, location, search history, buying behaviour, and viewing interests all contribute to what we see next. This has a profound impact on education. We can now find limitless resources in areas of interest, or a tsunami of low-quality, self-enforcing views based on hearsay and opinion.

Fundamentally different to the bound books of thoughtful deliberation and investigation that traditionally filled our libraries, this is the era of unstructured mass communication. Emails, blogs, social media, online reviews, fake-news, conspiracy theories, and opinions are producing unprecedented levels of data and information. According to IBM, 90% of all data that exists in the world today were generated in the past 2 years—fuelled by digitisation and the very human desire to communicate and share. The internet, cloud

storage, user-generated input, and computer processing capacity have made it possible for every person with an internet connection and an opinion to contribute to the fabric of global communications.

The world of education is no different. We have reached the point in time where almost every person on the planet has access to a smartphone. At one end of this phone are unlimited knowledge and resources, and at the other end is a person with a question to ask. The democratisation of information, the ability to seek and find answers with a single click, has changed the way we learn forever.

Our education system is now shaped by real-time data and live information that updates, morphs, and responds to human behaviour. As-it-happens information is broadcast into the hands of youth across the world, fed and distributed by social media, news feeds, and vast online communities. Generation Z has come of age. They fill our schools, they are permeating our higher education system, and many are taking their first step on the career ladder.

Take an average 21-year-old, just 10 years younger than the global median age of 31 (Central Intelligence Agency, 2018). Most 21-year-olds have little recollection of life before the internet, Google, YouTube, smartphones, social media, and streaming content. Technology has become a natural extension of their lives as they move unencumbered between platforms, devices, and software applications. It is no wonder that this generation holds such significant influence in today's society. They are self-discoverers, self-educators wandering through the limitless fields of free information, seeking relevant knowledge, finding solutions, and forging new frontiers.

As we, as adults, begin to comprehend the themes around machine learning and artificial intelligence, Generation Z are emerging from their screens with big ideas formed from their instinctive curiosity around technology and all the capability it brings. Blockchain, cryptocurrencies, the Internet of Things, 5G, neural networks,

machine learning, robotics, and automation are the building blocks of their future. As they jump from Netflix to Spotify, from Steam to Instagram, they don't reflect on their past experiences as users of scheduled television, CD collections, or bank cheques delivered through the post. Their memory only knows digital—fast, reliable, relevant, and immediate.

The young people of today have a builder's mentality. They look at problems through a solution lens. Why own a car when you can Uber or Zoomy? Why work in a dedicated office when you can work in co-working spaces with like-minded people? Why study a linear, single-subject specialisation when the world has become interdisciplinary, complex, and connected? Generation Z know their success will be defined through a series of actions and iterations that involve invention, launching, reinvention, pivoting, relaunching, and repeating. They live by the virtues of agile methodologies and have grown up on the concept of a "minimum viable product" (MVP).

The new generation of school leavers have seen members of their families lose jobs in fields where automation and digitisation have replaced or reduced the need for human skills—banking, travel, journalism, marketing, law, professional services, mining, ports, telcos, media outlets, retail, and hospitality have all felt the impact of digital disruption. These young people live in a messy, non-linear, squiggly world. They see significant misalignment between the complexity, ambiguity, volatility, and change of the world that beams in from their mobile screens and the neatly packaged and highly structured world of education.

In response to the arrival of Generation Z at universities, there has been a rise in online courses, applied modules, digital platforms, and non-traditional assessments designed to build flexibility into the world of higher education. However, most students in the tertiary education system know that, without significant workarounds or

hacking of existing programmes of study to meet personal interests, the university degree looks somewhat untouched.

The education debate is highly fuelled. Academic highbrow tut-tutting through to all-out protest at the mere mention of educational progress mean change is both hard and slow. There is an overriding sense of black or white in these arguments. There is little appetite for discussing the augmentation of education or taking a more “and–and” approach. No one is questioning the value of education. There will always be a need for higher education and specialist knowledge. There will always be doctors. However, we already know that the role of doctors is changing. Diagnostics is increasingly in the domain of data-scientists and algorithms. Personalised medication is being defined in response to the individual characteristics of the patient’s body, using digitised genome sequencing—all measured by precise technology-based advances.

We know that artificial intelligence, such as IBM’s Watson, is supporting and enhancing human understanding of medicine and that precision surgery is increasingly performed by a robot rather than a human surgeon. However, this augmentation of skills is not limited to medicine, or to engineering, law, or marketing. We are all moving on from our analogue systems, our paper-based processes, and our traditional book-based learning to the rapid adoption of contemporary digital methods.

Some of the world’s most progressive universities have acknowledged and responded to the seismic shift that is unfolding. They have responded by moving away from narrow fields of focus to create more meaningful connections between previously separated fields of knowledge. This merging has created new disciplines where the convergence of skills is defined by technological possibility. However, the high cost of education combined with the “opportunity cost” of students being unable to combine work and study has taken its toll.

In many fields, student numbers are declining. For many institutes, the decline in student numbers has resulted in government bailouts to keep them operational while education reforms take place.

New Zealand's place in the global economy requires us to capitalise on the emerging opportunities and solutions that are aligned with our international trading partners and high-demand, high-growth sectors. Higher education has a responsibility to lead this charge for students. The length of time it takes for global trends to impact the New Zealand market is decreasing as globalisation, connectivity, and networks are rapidly digitised. Traditional bodies of knowledge are being replaced by new information, research, and advancing technologies. Static or legacy knowledge has become a risk for both individuals and institutions as adaptation, flexibility, and contemporary understanding are prioritised in the new world of work.

As technology changes job tasks and creates entirely new industries, a corresponding change in skills, knowledge, and capabilities is required. If our tertiary sector poorly plans this transition, there is a real risk that there will be a widening skill shortage and knowledge gap. New Zealand's poor record of inequality based on the misalignment of education and skills and wealth-creation could lead to greater job displacement, skills devaluation, and the casualisation of work. The challenge and opportunity this creates is a uniquely human one that subtlety and tinkering at the margins will not address. In contrast to the higher education sector, business leaders have been forced to evolve and adapt to new operating models and to respond to changing consumer expectations, in order to survive financially. Almost overnight, entire industries have been made redundant as customers' expectations have changed.

To this point, new global entrants into the New Zealand marketplace in the past 12 months have included Lime scooters, Onzo bikes, Ola cars, Uber Eats, and Afterpay financial services. In each case,

local legacy providers had been operating in the New Zealand market for years without the ability to scale or transform behaviour. We have been able to hire bikes by the hour, have food delivered, and use a range of “layby” payment systems for decades, but until these new global technology players arrived on our doorstep, the organisations providing these services assumed it was “business as usual”. Simply stated, they could not imagine the digitalisation of their enterprise.

In the world of higher education there appears to be a similar sense of immunity. There is little debate or inquiry into what education reimagined would look like. The ongoing justification for traditional views of knowledge and the expectation that student demand will not change will eventually be the education sector’s downfall. What if tomorrow Google opened a free online university, linking local learners through shared meeting spaces, supported by the world’s best experts, rich online experiences, and access to projects, jobs, and opportunities? To say it won’t happen is both foolish and naïve.

Reinventing education for the masses is the biggest win for any company in the world. The demand for contemporary skills has never been higher, but traditional universities, with 3 and 4-year degrees, just haven’t responded fast enough. Whether it be Google, Facebook, Amazon, Apple, or another multi-billion-dollar company with deep reserves of data, today’s tech companies know more about Generation Z than Generation Z themselves. These companies’ ability to provide highly personalised, “learn, and you earn”, free, flexible higher education in areas of expertise where there is greatest global demand is on the horizon. Once these technology giants enter the education space, it will be the point of no return for our traditional institutes.

This scenario could be likened to scheduled TV versus Netflix. Both deliver video content, but one is inflexible, repetitive, has a limited selection of options and choice, and doesn’t remember anything about you. Right now, the arrival of a tech giant in the education

space seems improbable. After all, this is New Zealand, right? This was the same rationale used before the rapid demise of the global brick and mortar retail sector as Amazon brazenly “ate their lunch”. These global entities don’t need to pick New Zealand. New Zealand students will pick them.

However, in the harsh light of the inevitable, we can still do more. This is not the time to throw up our hands and give up on our children. We must not accept that today’s students, our future leaders, can be provided anything but the very best in education. We are all responsible for activating progress and change. We need to question whether a “major”—a single deep-dive into a narrow field of knowledge such as science, business, or computer science—is putting our “best foot forward” at a time when technological disruption, digital adoption, and convergence is defining our future.

We live in a world where technology has morphed with existing fields of knowledge—biotech, agritech, nanotech, edutech, creative technologies, human interaction design, and virtual reality. Sustainable systems—including plant proteins, new forms of energy, CRISPR gene editing, and the circular economy—have redefined disciplines. We need to encourage our students to develop skills to evaluate the impact of digitalisation in their future professional practice, including within global, local, and cultural contexts. We need to support learners to identify and connect complex and ever-changing information so they can see the emergence of new sectors and industries.

Today’s students need to develop deep awareness of and insight into changes in the broader society so they can critically evaluate their own personal and professional capacity to respond to constant change and evolution. Our education structures need to adjust, to accommodate a deeper understanding of the economy and our changing society and to enable the development of specific contemporary

skills to respond to the daily requirements of work.

Some global universities are responding to the need to change. California State University, Long Beach in California has partnered with the Institute of the Future with a project known as ‘Beach 2030’. This partnership is designed to ramp up the universities range of interdisciplinary courses to “reflect the fast-changing global landscape, to build future-ready students”. The Arizona State University opened a College of Integrative Arts and Sciences that has eliminated departments and now issues degrees that “meld” disciplines. Olin College, a private specialist engineering college, opened in 1997 to address the industry demand for graduates with hands-on engineering and design experience. Olin’s highly successful project-based teaching begins in a student’s first year and culminates in two senior “capstone” projects. More recently they have whittled down all their majors to just three—of which one is a major that allows students to curate and design a personal subject portfolio.

In a world where interdisciplinary knowledge is of growing importance, the continued division between departments creates barriers for students, not benefits. Inter-departmental rivalry has been a core feature of traditional higher education institutes, created as much by competition for funding and resourcing as by intentional or deliberate action.

The monolithic structures of traditional universities are in stark contrast to converging subjects that do not fit into predetermined boxes. Designing courses that are cross-disciplinary, where students can learn from the perspective of others, or interdisciplinary, where students integrate disciplines allowing for greater innovation, collaboration, and teamwork, is complicated and requires support from all members of faculty.

The University of Essex in the United Kingdom developed an Interdisciplinary Studies Centre that claims:

The flexibility and range of our courses enable you to develop a unique and wide-ranging perspective on your studies. All of our courses feature interdisciplinary modules taught by multiple lecturers from different departments. Optional modules allow you to customise your degree by selecting from different subject areas from across the University. (University of Essex, 2019)

The benefits of bringing disciplines together are obvious. Collaboration, co-operation, and the gathering together of skilled and diverse students to solve problems reduces the risks associated with the reinforcement of ideas through the absence of new inputs—much like a pond that turns stagnant when it has no new water supply. Deliberation, debate, and problem-solving function best when there is an eclectic group of people who approach and use information, knowledge, and experience in different ways.

So how does an education system steeped in tradition and deemed inaccessible to many—through high costs, social exclusion, or irrelevance—adapt? As a nation, we are polite, exceedingly so. The debate is uncomfortable, and people who challenge the status quo are often seen as activists or provocateurs. But what if New Zealand were to address the issue?

Addressing the issue would require significant structural changes. This process has started with the review of polytechnics—the Reform of Vocational Education (ROVE)—and the implementation of policy changes that are directly aligned to the findings captured through data (what is working, what is not) and statistics (which industries are growing, which are reducing, and in which sectors we should be encouraging further development and expertise) (Kōrero Mātauranga, 2019).

We also need to observe and learn from best practice around the world. As an example, the dual education system established in Germany, Austria, and Switzerland has been adopted in South

Korea, parts of Belgium, and in France (DC dVET, 2019). In this education system, students can learn one of the hundreds of apprenticeship occupations, such as programmer, dispensing optician, human resource worker, doctor's assistant, or builder. The precise skills and theory taught are strictly regulated and defined by national standards.

Students are provided with options between an academic pathway or a practical pathway, with the choice between them aligned to individual skills and passions. Both options are seen as highly credible, in contrast to a perception that university provides the only pathway to a career. The success of this dual system has been undeniable. Based on the current skills gaps in New Zealand, we could certainly benefit from it being rolled out here.

Building a dual system of education that equally supports the pursuits of students wishing to go into vocational, trades, skill-based, technology, or entrepreneurial fields would also reduce the low completion rates at New Zealand universities. In the absence of real alternatives, we still see large numbers of students undertaking tertiary education. Many complete; many don't. Results released by the Tertiary Education Commission (TEC) in October 2018 showed that two-thirds of students commencing their degrees at New Zealand universities did not complete them in the 3-year timeframe (TEC, 2018).

Further, the latest figures from the OECD have New Zealand tertiary graduation rates at 48.15%, one of the lowest in the OECD (OECD, 2018). While this data can be explained by many contributing factors, including New Zealand's very low unemployment rate, it warrants further investigation to better understand student expectations as we enter a new period with the arrival of Generation Z.

These changes are not limited to our country but are reflective of a global shift. In May 2018, the *New Zealand Herald* (Chung, 2018)

led with the provocative headline “Nearly half of Aussie degrees soon to be worthless”. The article focused on EY’s *University of the Future* report (FICCI Higher Education Committee, 2018), which interviewed more than 3,000 students and employers and more than 50 university leaders and policy makers in Australia. The report concluded that not all institutions would be able to “make the leap” to cope with industry disruption:

A growing cohort of graduates are leaving the university environment with more debts and few job prospects. Some university leaders estimate that around 40 percent of existing degrees will soon be obsolete, which may mean institutions will lose their ‘cash cows’ and be forced into specialisation paths they may have not chosen. And some institutions have yet to digitise their operating models. (Chung, 2018)

Highlighted in the report were the 46% of current students and past graduates interviewed who said their degree needed to be overhauled in light of the impact of digital technologies. Graduates were also asked whether their degree was relevant to their chosen career. Management students stated their degree was 67% relevant; psychology students also claimed 67% relevancy; architecture and built environment, and creative arts stated 48% relevancy; and science and mathematics 41% relevancy. However, in the humanities, culture, and social sciences, just 36% of students felt their qualification was relevant to their chosen career. Meanwhile, more than half of employers surveyed said degrees in commerce and management were not worthwhile. Catherine Friday, for EY Oceania, stated that “Rather than saying specific types of degrees will be redundant, we are saying it’s those that don’t evolve to include far more opportunities for work-integrated learning” (Chung, 2018).

The EY report included four possible future scenarios for Australian universities (Chung, 2018):

1. **Champion University:** A hands-on government actively champions universities as strategic national assets. Most students enrol in traditional undergraduate and graduate degree programmes. Universities streamline operations by transforming service delivery and administration.
2. **Commercial University:** A hands-off government requires universities to be financially independent to ease national budget pressures. Students favour degree programmes that offer work-integrated learning. Universities reposition by drawing closer to industry to collaborate on teaching and research.
3. **Disruptor University:** A hands-off government deregulates the sector to drive competition and efficiency. Continuous learners and their preferences for on-demand micro-certificates dominate as technology disrupts the workplace. Universities expand into new markets and services and compete against a range of new local and global educational services providers.
4. **Virtual University:** An activist government restructures the tertiary sector to integrate universities and vocational institutes, prioritising training and employability outcomes as humans begin to be replaced by machines. Continuous learners are the majority, preferring unbundled courses delivered flexibly and online. Universities restructure into networks that share digital platforms.

The pros and cons of each of the outlined scenarios can be debated in an Australian context, where competition from private universities such as Carnegie Mellon University, Torrens University, and Bond University has been able to operate and where highly reputable private universities such as Stanford have formed partnerships with local universities. All eight New Zealand universities are public and, to date, no international universities have been granted the ability to operate in the country. While this enables a high level of quality

assurance, the unintended consequence of keeping global competition at bay could result in greater interest from New Zealand students in looking offshore or online.

One existing tertiary education platform, Udacity, offers nano-degrees in some of the world's highest demand areas (Udacity, 2019). These include Artificial Intelligence, Deep Learning, Natural Language Processing, Data Analyst, Blockchain, Full Stack Developer, Virtual Reality, Robotics, Self-Driving Car, and Business Analytics. Forty thousand students completed and graduated from one of the paid nano-degree programmes in 2018.

There is no single answer to the challenges the education sector is facing. We are standing at a crossroads and the solution requires us to head both north and south to address students' expectations of new ways of learning and new learning areas. The starting point is the recognition that Gen Z has a fundamentally different relationship with information and learning. They have grown up in the digital era where information of interest is pushed to them without them actively seeking it out. Their understanding of how information is structured and connected online means they are highly adept researchers—they follow one source to another with ease and confidence.

This new generation values experiences. Generation Z are more focused on fairness, equity, sustainability, and the environment than any previous generation. They expect to be actively engaged in their learning, not “taught”. They are much more likely to value like-minded mentoring and peer reviews than the views of traditional academics.

Research from the culture, compensation, and career monitoring site Comparably.com gathered data between March 2016 and April 2018. The Comparably research revealed that nearly half, or 45%, of Generation Z respondents would like to start their own business in the next 5 years. More than any other age group, Generation Z

are very concerned about the impact automation will have on their future job prospects. Forty-one percent of Generation Z respondents to Comparably's survey said they believe "robots will take over their jobs in the next ten years" (Comparably, 2018).

The decisions Generation Z are already making about their education, their careers, and the role they want to play in the future will have a profound effect on tertiary education. What we do know is that "more of the same" will not work for the world's largest cohort of humans. Generation Z are knocking at our higher education door. Let's make sure we are ready to let them in.

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