OPEN

How we'll work, live
and learn in the future

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Introduction

At 3.00 p.m. on Friday 13th August 1999, I was stuck in the UK's longest-ever traffic jam, with a heart attack. To add further drama to the situation, not that I was particularly looking for more, I had my two young sons in the back of the car. I knew that I couldn't leave them while I went in search of an ambulance. I've never been quite so dismissive of Friday the 13th since.

My chest was tightening, I was struggling to breathe, and my heart was racing irregularly. In fact, it was beating so fast that I gave up taking my pulse when I realised it was over 200 beats per minute. Somehow, I managed to hang on for a further two hours, crawling along until I got home and was finally able to call an ambulance.

After the doctor calmed me down, she explained that I hadn't actually had a heart attack, though it bore many of the hallmarks of one. I'd actually had an episode of something called 'atrial fibrillation', and she said that I had better get used to such episodes because I was likely to have more in the future. And indeed I did. The real problem, however, lay in trying to establish an underlying cause. As I'd been a competitive marathoner for some years, and was still in training, the consultants misdiagnosed a condition known as 'athlete's heart' – a benign, temporary enlargement of the heart muscles.

Eventually, it became clear that I had a genetically inherited condition known as 'hypertrophic cardiomyopathy'. The doctor casually observed that one of the risk factors was 'sudden death', so I shouldn't really undertake any strenuous exercise.

By this time I'd discovered Google search, so I spent the next two weeks terrifying myself into thinking I was going to suddenly drop down dead; if you try searching 'hypertrophic cardiomyopathy' you'll see what I mean. Once the specialists told me that having completed several sub three-hour marathons, it was very likely that I was at the mildest end of the spectrum, I relaxed a little.

However, the atrial fibrillation episodes eventually became more frequent and because fibrillating atria can't pump blood effectively, I was told that the 'AFib' was likely to become permanent. It seemed as though I would inevitably follow my father in having a series of disabling strokes.

I don't declare my health history because I'm a hypochondriac. I'm telling you all this because what happened next brought me face-to-face with one of the most powerful learning experiences I have ever had, and one which embodies a set of social phenomena which is radically changing how we live our lives.

You see, I discovered an internet forum for fellow atrial fibrillation sufferers.

I know what you're thinking: 'Is that it?' Because it's a measure of how ubiquitous these

self-help groups have become, that we barely stop to think how they have impacted upon the lives of, well, almost everyone with an internet connection. But imagine for a moment the fate of a frightened, newly-diagnosed patient before forums existed. Other than leafing through an out-of-date medical encyclopedia, the curious patient in the search of learning was entirely dependent upon medical professionals. Opportunities to understand their illness from a fellow patient's perspective were often limited to snatched waiting-room conversations. Even obtaining a professional second opinion was frowned upon.

In my case, I was able to reduce the frequency of these episodes from almost daily to once a year or so, thanks to the generosity of people who had expertise and personal experiences they wished to freely share in order to gain fresh insights and to help others.

These small acts of kindness between strangers populate and enliven forums like the one I visited. They happen so frequently that we no longer find this phenomenon the heart-warming miracle it truly is.

What happened during my time on the Afib forum is just one example among billions. In isolation, we don't think of them as anything out of the ordinary. Collectively, however, they represent a social movement affecting almost every aspect of our lives. We're radically transforming how we communicate, share and learn from each other. In a nutshell, we're going 'open'.

The Open Revolution

Going 'open' is a social revolution that represents a fundamental challenge to the established order of things – one that cannot be ignored. It disrupts and changes, so things can never be the same again. But, as with all revolutions, there are winners and losers.

The winners are ourselves, happily connecting and collaborating with global networks of friends, colleagues and online acquaintances. We are powerfully motivated by the easy access to ideas and information, and the informality, immediacy and autonomy that it brings.

The losers are our formal institutions: businesses, schools, colleges and public services that are failing to grasp the enormity of the change taking place. Most dramatically, the losers are also governments around the world that are now confronted by citizens who will no longer tolerate secrecy and deception. The toppled dictatorships of the Arab Spring may provide the most graphic illustration of this, but there are plenty of others. The fall-out from WikiLeaks, and the 2013 revelations of government-sponsored internet spying in the United States and the United Kingdom, point to a more widespread culture clash.

These institutions are still governing, trading and training for a world that no longer exists, let alone a world that could be. They're bewildered by the shedding of compliance and the

insistence upon accountability that now defines us as consumers and citizens. We want our governments and public institutions to be transparent. We expect a different set of relationships with companies we buy from, and invest in, based upon social and ethical concerns, not simply financial ones.

How did we get to be so demanding? The answer, I believe, is simple: we became much smarter learners.

Because information flows faster and more freely than ever, and because we are better connected than ever, the barriers to learning are being dismantled. We share what we learn instantly and, generally, without restrictions. How we learn, and whom we learn from, has been transformed. Our reliance upon anointed experts and authority figures has diminished, while our capacity to learn from each other has spiralled.

And it's just as well, because the world has never before faced such a complex set of societal, economic, political and environmental challenges. They're so complex that governments and corporations can't fix them alone. Instead, they will increasingly look for user-generated solutions. This is why learning matters, and why *how* we learn has to change.

Learning happens in three locations: in formal education (schools and colleges); in the workplace, and in our home and leisure time (let's call it the social space). While we've become smarter learners, progress has been uneven. In just ten years our learning in the social space has irrevocably changed, largely because it has become 'open'. We are now learning more from our peers than we ever learned in school. We're removing the intermediaries from every aspect of our lives so that we can directly deal with, and talk to each other in ways that have only become possible in the 21st century. We've even created our own 'sharing' economy.

Aside from some notable exceptions, however, learning in the workplace and in our schools and colleges remains static. The central message contained within these pages is that going 'open' in our formal institutions, will turn learning enclosures into learning commons, and significantly improve all our lives.

'Open' is a messy and at times chaotic phenomenon, but it isn't about to go into reverse. It has changed how we live and learn, socially. If we fully understand and grasp its potential, we can be more engaged and fulfilled in our work and studies, and better able to adapt to the uncertainties that we face in the future.

Chapter One

The State We're In

By any yardstick, 2011 was a pretty tumultuous year for social action. When Mohamed Bouazizi, a Tunisian street fruit-seller, set himself alight in protest at his scales being taken from him by an over-aggressive policewoman, few would have seen this apparently futile act of self-immolation as the first flowering of the Arab Spring. The public protest, which began on 17th December 2010, after Bouazizi's death, quickly spread from his home town of Sidi Bouzid to the capital, Tunis, and soon engulfed Egypt, Syria and Libya, eventually affecting almost every country in the Middle East.

In the UK, eight months later, on a hot August night in London, insensitivity shown by police in Tottenham, following the fatal shooting of Mark Duggan, turned a peaceful protest ugly. A crowd (mainly consisting of Duggan's family and friends) were refused a meeting with senior police officers. Hours passed and, with anger rising, the protesters refused to go home. Soon they were joined by a younger, more militant crowd, and by 10 p.m. shops, police cars and homes in Tottenham were ablaze. Over the course of the next four days the rioting spread to many cities in England. Claims for compensation in London alone exceeded £300m. Five people died and a traumatised nation looked for underlying reasons. The UK Prime Minister, David Cameron, had no doubts. Refusing calls for a government inquiry, he dismissed the riots as 'criminality, pure and simple'. The Guardian newspaper came to a rather different conclusion. In 'Reading The Riots', a report jointly commissioned with the London School of Economics, 85 percent of the 270 rioters questioned said that aggressive policing was an important factor in why the riots happened.

On 17th September, Adbusters, a self-styled 'global network of culture jammers', issued a call for people to march through Lower Manhattan to 'Occupy Wall Street'. Over 5,000 people responded. The anthropology scholar David Graebner, (who is credited with the totemic 'We Are The 99%' slogan) urged the protestors to set up long-term encampments. To the obvious frustration of press and TV, the emerging Occupy movement refused to conform to common stereotypes of organised rebellion – it had no leaders, no articulated 'demands'. In essence, it sought to model participatory democracy in miniature on each site. The speed of the global spread of the movement took almost all of the media outlets by surprise. By December 2011, 2,720 'occupations' were taking place in cities in over 20 countries.

In the spring of 2011, the global financial crisis was triggering contagion among Eurozone countries: first Greece, then Spain, then Italy and Portugal. Young Spaniards took to the streets

as youth unemployment climbed throughout the summer to almost 60 percent. Over six million people – young and old – took part in marches and encampments. As their economy faced meltdown, Greece witnessed sporadic civil unrest. However, when a series of austerity measures were announced in the summer and autumn of 2011, the protesters intensified their demonstrations and protests and coordinated their actions with the Occupy gatherings that were being held globally.

Things Fall Apart

It seemed like the whole world was angry. But to see the protests in North Africa, Europe and the United States as a series of disconnected events, would, in my view, be a mistake. For one thing, we've seen this movie before.

In mid-19th century France, King Louis Phillipe attempted to reinforce his increasingly shaky grip on power by enforcing an already-established ban on public assemblies. Political activists, however, found an ingenious way around this. Dubbed the '*Campagne des Banquets*' (the banquet campaign) a series of meetings circumvented the 1835 law which banned public assemblies, by describing them as private banquets. It's perhaps only the French who would combine political agitation with fine dining, but its effect was profound. No doubt fuelled by some tasty wines, it's believed that the *'Liberté, Egalité, Fraternité'* motto was coined at one such banquet.

Their popularity quickly grew and pretty soon every province in France was staging banquet campaigns. The King felt decidedly uneasy about these social (though notionally private) gatherings and banned a large one planned for 22nd February 1848. In hindsight, this was not one of his better decisions. The resulting riot triggered the start of the 1848 revolution and the end of his reign in France. Passing the decidedly hot potato of kingship to his nine-year-old grandson, Phillipe, Louis Phillipe caught the next cab to London calling himself 'Mr Smith' (I'm not making this up) where he lived out the rest of his days while back in Paris, the 'Second Republic' was proclaimed.

Throughout 1848, rebellions and revolts took place in Italy, Switzerland, Hungary, Denmark, Germany, Ireland, Poland, Belgium, and even Brazil. It was every bit as dramatic as the domino-effect witnessed in the Arab Spring of 2011, even if all of the uprisings were subsequently quashed. However, these popular rebellions eventually resulted, in most countries, in either constitutional reform or, in the case of France and Russia, in full-blown, bloody revolution.

Like the global discontent seen in 2011, the mass demonstrations of 1848 appeared to have no through-line, no linking narrative; but look a little closer, and some striking similarities

appear.

First, many of the participants in the uprisings of 1848 and 2011 shared a common demographic: a young middle-class, hell-bent on political reform, allied to a young (non) working-class, hell-bent on a better quality of life. The people on the streets in Tunisia, Egypt, Yemen and Syria were predominantly young, middle-class and well-educated, but they were soon joined by the poor, unemployed and uneducated. Similarly, the Occupy Wall Street protestors – two-thirds of whom were below the age of 35 – were a combination of employed graduates and the unemployed and/or homeless. This union, between the well-educated middle-class and the oppressed poor, was also a common feature of the 1848 rebellions

Second, the coalition of intellectuals and unemployed fuelled ambitions not just for a rebalancing of wealth, but for wholesale systemic change. Though rebellions in both centuries had specific political demands, they were primarily about the emergence of a broader set of philosophies; it's no coincidence that Karl Marx published the Communist Manifesto in 1848.

Third, the ideas behind these new social and political movements were able to propagate through the rise of disruptive, facilitative technologies. The mid-19th century saw the arrival of the popular press – European daily newspapers, like *Le Figaro* (France), *Corriere Della Sera* (Italy), *Die Frankfurter Allgemeine Zeitung* (Germany), were founded at this time. The growing numbers of literate middle-class Europeans were therefore able to learn about the protests with unprecedented speed.

In 2011, the disruptive technologies were digital, with social media and citizen journalism at the forefront, flat-footing both mainstream media and the police with their speed and agility. Before Mayor Bloomberg ordered the eviction of Occupy protestors from New York's Zuccotti Park, he cleared out the journalists, attempting to impose a media blackout. But I was one of 700,000 viewers who watched the evictions live, thanks to Tim Pool reporting on Ustream, using nothing more than a smartphone. Rioters in London were able to out-manoeuvre police riot squads by using Blackberry's private messaging system and the use of Twitter and YouTube in publicising the Arab uprisings is well-documented: the most popular Twitter hashtag of 2011 was #egypt.

So, having witnessed the confluence of factors in the late 19th century – a common demographic, a set of higher goals, the advent of powerful information technologies, and a reanimated counter culture – we should not have been too surprised by the events of 2011.

Eating Our Lunch

A sense of indignity was, and continues to be, felt by young people from Tottenham to Tunisia,

from San Francisco to Santander. They did as they were told, worked hard, got a degree and yet, through no fault of their own, now have little chance of reaching the level of prosperity their parents enjoyed.

While the young feel anger at the loss of their future, the rest of us feel frustration. The after-shock of the global financial crisis is compounded by the dawning realisation that globalisation isn't simply an economic theory. It has costs and human consequences – and there seems to be nothing we can do about it. Government actions are outmuscled by multi-national corporate strategies.

When President Obama asked to meet with Steve Jobs, the late Apple boss, his first question was 'how much would it cost to make the iPhone in the United States, instead of overseas?' Jobs was characteristically blunt, asserting that 'those jobs are never coming back'. In point of fact, it's been estimated that making iPhones exclusively in the US would add around $65 to the cost of each phone – not an unaffordable cost, or an unthinkable drop in margin for Apple, if it meant bringing jobs back home.

But American workers aren't going to be making iPhones anytime soon, because of the need for speed, and scale, in getting the product on to shelves around the world. When Apple assessed the global demand for the iPhone it estimated that it would need almost 9,000 engineers overseeing the production process to meet demand. Their analysts reported that it would take nine months to recruit that many engineers in the US – in China, it took 15 days. It's these kind of tales that cause US conservative media outlets to graphically describe Asia as 'eating the lunch' off the tables of patriotic, if sleep-walking, American citizens.

If Apple had chosen to go to India, instead of China, the costs may have been slightly higher, but the supply of suitably qualified engineers would have been just as plentiful. While China may be the world's biggest manufacturing plant, India is set to lead the way in the industry that poses the biggest threat to western middle-class parents seeking to put their sons or daughters through college: knowledge.

The Myth of the Knowledge Economy

Ah yes, knowledge. Acquiring and applying knowledge in order to remain economically competitive is, of course, the whole point of the learning revolution. Yet here again, we've been wrong-footed. Part of the reason for the state we're in is our failure to anticipate that, while the social value of knowledge would soar (as we'll see in the chapters that follow), its economic value would plummet.

During the 1990s a phalanx of futurologists told us that the 'knowledge economy' would follow the industrial economy, and we were set to clean up, because: a) we had the best

universities in the world, and b) we spoke English, the universal language of knowledge. The rationale was that, in the future, knowledge would be at a premium, and could only increase in value. This was the doctrine that persuaded Tony Blair, the newly-elected UK Prime Minister, in 1997, to famously state his three priorities as 'education, education and education'.

The blind faith in knowledge, however, turned out to be misplaced. Thanks to the ubiquity of the internet, and the rapid scaling up of tertiary education in countries like Brazil, Russia, India and China (the so-called BRIC economies) the futurologists couldn't have been more wrong.

The first decade of the 21st century saw the balance of power in the knowledge economy decisively swing, from the West to the East, partly due to the eternal laws of supply and demand. Having a market flooded with BRIC graduates means that the price of knowledge has gone down, not up. These days, there is simply no point in paying $15,000 for a basic website (yes, that's really what they used to cost). Far better to either pay $500 for an Indian IT graduate to do it for you, or if you're prepared to teach yourself some basic web skills, get one of the free sites available online.

We all enjoy getting information at low, or no cost, but this simple illustration highlights one of the most turbulent social problems the West faces: the misalignment of professional skills to market conditions. If you are a middle-class parent reading this, consider the following statistic: of the UK graduates who left university in 2007, 28 percent of them were without a full-time job three years later.[1] Clearly, some of the increase can be attributed to rising unemployment, and, in particular, youth unemployment, as a result of the sluggish UK economy. But, it seems as though the old axiom that 'learning is earning' – that, over the course of their working lives, graduates will always earn more money than non-graduates – may no longer be the case, especially given the rising costs of attending university.

Academics James Paul Gee and David Williamson Shaffer have warned against the dangers of assuming that the jobs that are disappearing in the US are simply call centres or blue-collar work:

> "It is a mistake – a potentially disastrous mistake – to think of job loss in America as only about the old manufacturing jobs. Many of those are gone already, and the assembly lines that are left are high tech, anyway. Now the scientific, medical, technological, and engineering jobs are starting to go too."[2]

The End of 'The Job'

Gee and Shaffer highlight the difference between 'commodity jobs' – standardised, replicable and sold at a reasonable price – and 'innovation jobs', which require specialised, unique skills.

Because it's a relatively simple task to train workers doing commodity jobs, they can be hired anywhere in the world. Gee and Shaffer argue that the US education system is still preparing students for commodity jobs, and thus facing overwhelming competition from developing countries, when it should be educating and training for 'innovation jobs', which are less easily outsourced.

In fact, 'jobs' is something of a misnomer: in the future, we are more likely to be talking about 'tasks' or contracts. Phillip Brown's book, *The Global Auction*, shows how companies can now slash costs by disaggregating what used to be a full-time job into a series of tasks, that can then be commissioned via a global 'reverse auction'. Banish any idea of eBay-style rising bids here – in these auctions, the lowest price for the job usually wins. The stark reality is that the middle-classes of the developed world are now in a 'high skills/low income' environment, and the prospects for graduates entering the knowledge economy are going to be tough for a long time to come.

If all this comes as news to you, then don't beat yourself up over it. I see no evidence of our schools, universities or indeed politicians talking about this unsettling future, this radical transformation of the labour market. In mainstream media broadcasts we only hear about Chinese and Indian workers stealing our lunch, triggering wide-scale job losses when the point surely is about the loss of 'the job'. The social forecaster, Paul Saffo, asserts that 'figuring out what will replace the job is the greatest challenge of the next 30 years'.

We've been hearing for a long time about how the future will require us all to have 'portfolio careers'. Our kids are less likely to be applying for jobs and more likely to be bidding for contracts. I speak from personal experience, here. At the time of writing, both my sons are in their mid-twenties, and both bid for IT-related contracts on a variety of auction sites. In order to try to understand how much the labour market was changing, I visited one of the sites they are registered with. I'd strongly recommend that you do too, because here's where you'll find the future, except it's happening now.

Shopping for Skills

Elance.com is perhaps the longest-established of many sites which specialise in 'Knowledge Process Outsourcing' (KPO). With over 1.3 million contractors registered by 2012, it had brokered almost half a billion dollars in contracts, taking a cut of between seven and eight percent. It posts well over 50,000 'jobs' a month and in a 2011 poll, 36 percent of contractors using Elance said it was their sole source of income. Every step of the process, from recruitment, to selection, to managing the contractor, and then paying them, is handled through the site.

The range of professional services being brokered is impressive – programmers, designers, researchers, marketers, engineers, managers, lawyers, journalists – and becoming more diverse by the month. But the power of such sites, and the foreteller of what lies ahead, is in the section that allows you to see the Dutch auction in progress. US contractors, pitching for legal work, will quote around $125 per hour; Indian contractors, just as well qualified as their American equivalents, are asking for $15 per hour. So, all things being equal, whose bid are you likely to accept?

The numbers are mind-blowing. In 2012, knowledge process outsourcing was set to contribute over 15 billion US dollars to the Indian economy, fuelled by an almost endless supply of highly-qualified graduates, willing to work for a fraction of the wages of contractors in the West. The 'high skills/low income' economy very much depends upon where you're sitting.

Whether it's Apple outsourcing technical and manufacturing jobs to China, or hundreds of thousands of small western enterprises managing contractors in India, these new employment structures are shaking up the knowledge economy. We're building flexible, virtual project delivery teams, made up of graduates working in several countries, linked only by a broadband connection and a desire to keep their reputation rating high and our costs low. KPO is one of the key reasons why highly-effective corporations are turning bigger profits with fewer full-time staff. Our politicians, meanwhile, are either afraid to alert middle-class parents to the growing crisis, or they're simply not getting it.

Let me sound a note of caution in this bleak scenario. I am not saying we face a future without recognisable jobs. It's difficult, for example, to see how service economy jobs can be broken down and shipped out to the lowest bidder. No one is going to outsource the driving of a London bus to Elance – yet. Indeed, the kind of skilled jobs that countries like the UK and Australia once looked to migrant workers to fill – carpenters, electricians, plumbers and the like – are now likely to be sought after by unemployed white-collar professionals.

Elance, and other skills auction sites, however, represent only the vanguard of a hugely disruptive movement, a process known as *disintermediation'*. In almost every form of transaction we make, social and cultural as well as financial, we're removing the 'middle-men' who historically have connected producer to customers, experts to novices. It's probably more accurate, in fact, to call this process 'digital mediation' because in most cases, we're replacing human intermediaries with almost zero-cost, user-generated, online connectors. Think TripAdvisor and LinkedIn, rather than your local travel or employment agencies. Because it's a relatively recent phenomenon, we're uncertain where it will take us, but it's already clear that business will never be the same again. If we already have surgeons halfway around the world

remotely steering robots in hospital operations, then how long will it be before we are using Dutch auctions for a range of jobs previously thought to be 'indigenous'?

The End of Growth

So far, I've argued that we need to radically re-think how we learn and innovate at work, as well as reshape our education systems, in response to the seismic societal shifts now upon us. The new landscape demands that we unlearn our view of knowledge, traditional employment structures and any expectation of economic privilege.

The difficult but unavoidable truth is that we are in the midst of a global economic rebalancing, which will take decades to sort itself out. In the meantime, our sons and daughters are stepping into a debt-laden, terrifyingly competitive future. Can it get any worse? Potentially, yes, but how we view the future depends on whether we can teach ourselves to think differently. Let me explain.

There is a growing body of people who argue that all of the above means we've reached a watershed. Instead of planning for the return of economic growth they are predicting the end of growth; that we are entering a 'post-growth' world and we should welcome it. Before I introduce you to one of their most articulate spokespersons, let me just allay any fears you may have that their model suggests a dystopian future straight out of the film, 'Blade Runner'. Their projection of life in 2050, *if* (and it's a whopping big if) we have the courage and social responsibility to think anew, is actually quite heart-warming. Their view of the future means we'll return to localised, community-determined decision-making based on shared interests and the common good.

To better understand a possible post-growth future, I met with Donnie Maclurcan, one of a team of seven people that make up the Post Growth Institute. Donnie lives on the Hawkesbury River, just north of Sydney and, despite only being in his early thirties, has already packed a lot into his life. In another life, he might have been a hedge fund trader. At the age of eight he was an art dealer, selling his brother's art works. By the time he was 10, he'd set up his first enterprise – an ironing business, charging 15 cents a shirt. He started trading shares when he was 12, and it seemed his future as an entrepreneur was already mapped out.

But Donnie also had a passion for sports and community service. He trained as an exercise physiologist and spent time working with Sydney's homeless. In 2002, at the age of 19, he became 'that bloke who ran across Australia'. Raising money for a sight-restoration charity, Donnie ran almost 4,000 kilometres, from Perth to Sydney. Averaging over 60 kilometres a day, and, running through some of the hottest, uncompromising landscapes in Australia, Donnie arrived at the Sydney Opera House 66 days after leaving Perth Bell Tower. A remarkable

achievement, is it not?

That's not the half of it. Donnie broke his ankle on the fifth day of the run.

If you're thinking 'type A' personality, you're not wrong. He subsequently completed his doctorate and has written two books on his specialism, nanotechnology and its potential for international development. His epiphany, however, came when he was working with the homeless and hearing tales from bright, successful people whose lives had gone catastrophically wrong through no fault of their own, merely because of fluctuating economic circumstances. It gathered urgency when rooting through 'throw out' items Sydneysiders leave on the streets for collection, he found fourteen US dollars in coins. How disposable had our society become, he wondered, if we now throw money away?

So Donnie set up a social enterprise to support new not-for-profit companies in Australia. It's work that he passionately believes in and he is convinced we are heading towards a not-for-profit future. Citing a recent report by Deloitte,[3] which shows a steady 75 percent overall decline in corporate performance since 1965, Maclurcan argues the relentless pressure on profits will prove unsustainable:

> "The for-profits will collapse because shareholders are demanding profit. Whereas, the not-for-profit model has desirability, sustainability, feasibility and inevitability on its side. This is an emerging international trend. My hypothesis is that 'for-profits' will become uneconomic over the next 40 to 50 years. Wouldn't it be nice to shift to a not-for-profit economy where purpose drives our primary outcomes, in terms of business?"

Organisations like the Post Growth Institute challenge us to redefine what we mean by prosperity. They argue that we should *aim* for, not avert, low growth. They advocate ditching our addiction to profit, by managing our assets – human, ecological, financial and communal – more responsibly. And this, according to Donnie Maclurcan, also applies to how we learn:

> "We'll need to see a bigger emphasis on asset-based economics that asks 'what do we already have?'. Just about all our approaches to formal education, across all subjects, promote a narrow way of thinking that reinforces our dominant economic paradigm. We need asset-based approaches to education – what do you already know, what have you got to share, what can we build on?"

Donnie's hypothesis may seem far-fetched, even idealistic. But we need look no further than the phenomenal growth of the 'sharing economy' to see that our innate desire to share what we know is being matched by the popular will to share what we own. Companies like Airbnb (let

out a room in your house), Google-backed RelayRides (peer-to-peer car lending), Lending Club (peer-to-peer loans service) and Streetbank (share your under-used tools and skills) could either be seen as confirmation of an age of austerity, or an altruistic and ingenious way around it. One person's apocalypse is another's Aquarius.

Cheer Up, It Might Never Happen

I've presented a broad-ranging picture of some of the economic, social, environmental and political turbulence which has shaped our most recent past, and will dominate our immediate future. It's important to set the context for what comes next in this book, and not just because the complex challenges we face will need to be addressed by those who are likely to suffer the consequences most sharply: the current under 25s.

The importance also lies in the inter-connectivity: social movements in the Middle East trigger concerns about our reliance on non-renewable energies; successful pitches by IT engineers in India provoke angst among middle-class parents in Hertfordshire; a butterfly flaps its wings in Manila, and a university professor rewrites her lecture in Texas.

We face a complex set of possible futures and no one can authoritatively predict how things will look in ten years, let alone by the end of the century. We know only two things for certain. The first is that we should learn to embrace uncertainty, because this age of uncertainty could become permanent. The second is that if all the old certainties are gone, then we have to be open to radical shifts in how we work, live and learn. That's why going 'open' is unavoidable.

With all the preceding 'end ofs' it might appear that we're also approaching the end of optimism. I don't believe this to be the case. As Ian Dury sang, we have reasons to be cheerful, one, two, three.

The first is the political and civic re-engagement of young people around the world. It may be troubling for authoritarian governments and disturbing for sectors of the corporate world, but the combined energy and ingenuity we witnessed through social activism in 2011 is heartening for the rest of us. It suggests that the global challenges we face will be met by people who care, who are smart, and who know how to organise themselves. 2011 also marked the point where many of these groups stopped being intimidated by their masters and began to appreciate the power of reciprocal learning and collaborative action.

The second is that we are at the start of a number of other transformations – all of which share the principles of 'open'. As my friend and colleague Mark Stevenson observed in his book, '*An Optimist's Tour of the Future*',[4] it's not always easy to appreciate the significance of the current scientific leaps of progress in nanotechnology, robotics, biotechnology, solar power,

bacteriology or agriculture. These developments are nascent, feel like pure science fiction, but could possibly lead us to an age of abundance, and cheerfully confound the prophets of doom.

The third reason is not only the subject of the rest of this book, it's the energy that fuels the rapid progress we can make from here. The opening of learning is transforming every aspect of our lives. It offers the promise of a more equal distribution of wealth, opportunity and power. It can close the gap between rich and poor, sick and healthy, strong and weak, and it accelerates the speed at which we solve intractable problems.

We've never freed-up, shared, and trusted ourselves with knowledge like this before, so we are still coming to terms with it. How do we ensure that its applications can improve our lives, while protecting ourselves from abuses of trust? How do our minds cope with the torrent of information coming at us from every angle, every day? How do we convert so much knowledge into socially productive wisdom? What can we do to close the gap between those who have access to open learning, and those who (still) do not?

The genuine democratisation of knowing is still being fought over. While it's deeply disturbing to some with commercial and political vested interests, it's wildly exciting to social and civic activists who, in the words of one of the protestors of 2011, 'have turned off their TVs, and entered into community with each other'.[5] Let's see what it looks like.

Chapter Two

So What Does Open Mean?

Andrew Ng is an Associate Professor, and Director of the Artificial Intelligence Lab at Stanford University in California. He's an engaging presenter, so it's not surprising that his courses are some of the most popular on campus. Machine Learning ('the science of getting computers to act without being explicitly programmed') attracts about 350 students per year. But when Andrew decided to open the course to the general public, over 100,000 people registered. Coursera administers Machine Learning, and a growing range of online courses, to students around the world.

Although a for-profit start-up, Coursera has, at the time of writing, offered its courses for free in its first two years of existence, and over 4.5 million students have already signed up. 'Classes' are typically 8-10 minute video lectures, interspersed with short quizzes, to test for comprehension. There are also question and answer forums, with an astonishing average response time of 22 minutes. This is attributed to having students scattered around the world – there is almost always someone online, 24 hours a day, willing to offer a response. With such large numbers, having academics assess student work became unrealistic, so Coursera instigated peer assessment. Tens of thousands of students graded each other's work. Many academics were horrified at the prospect of students assessing each other, but pilot studies demonstrated that peer grading at Coursera almost always correlates to tutor grading.

Daphne Koller, Coursera's co-founder, is convinced that Massive Open Online Courses (MOOCs) such as Machine Learning have the potential to 'establish education as a fundamental human right, where anyone around the world with the ability and the motivation could get the skills that they need to make a better life for themselves'.

A farmer in a remote village in Africa finds his small potato crop under attack from ants. He cycles to the cyber cafe in the nearest town and learns that the ants are repelled by scattering ashes on the soil around the potatoes. On returning home, he scribbles down the solution, and pins it to the village noticeboard so that his neighbours can follow suit. A whole village escapes a devastating drop in collective income. Colonies of ants have to look elsewhere for food.

In pubs all over England, small groups of people who share a passion for beer and philosophy gather to discuss modern-day dilemmas such as 'Can the use of power ever be justified?', 'What is the purpose of literature?' and 'Is "Why" a daft question?'. The 'Philosophy in Pubs' group may wish to plan a vacation to Seattle to meet the 'Drunken Philosophers', or

indeed (for somewhere warmer) to Singapore where 25 members regularly meet at the Raffles Hotel. There are groups of amateur philosophers meeting in cafes and pubs in almost every major city around the world. Nothing new in that – philosophers have been doing it for centuries. But now they are no longer intellectual cliques, they're open to anyone.

It's not just philosophy. Anyone who wants to meet people and learn something new simply has to go to the meetup.com website, where every possible (legal) interest is catered for. Meetup enables over eight million users, in over 100 countries, to physically attend over 50,000 Meetups per week. Yes, you read that right – per week. Its founder, Scott Heiferman, had the idea of a global noticeboard, in the wake of 9/11 and, specifically, after reading Robert Putnam's account of an increasingly disconnected America, 'Bowling Alone'. Like many social entrepreneurs, he is passionate about harnessing global communications to build stronger local communities.

These examples are a fairly random, microscopic slice of a phenomenon which is radically re-shaping how we live, work and learn in the 21st century. You probably take part in a revolutionary act several times a day. It may not feel very revolutionary, partly because we're in the thick of it, without the benefit of hindsight and partly because in a relatively short space of time it has become almost second nature for us to learn differently.

'Open' is a disruptive force because in the places where we spend most of our waking hours – the office, school or college – it's been pretty much business as usual. It's often said that a time-traveller from the 19th century, beamed into today's world, would be bewildered by everything he witnessed, but would instantly feel comfortable in a school. Similarly, although the tools of the trade have changed, today's office learning culture has changed little since the 1960s.

Now, these two sectors are coming under intense pressure to radically overhaul their learning systems. The problem stems from the ways in which we learn when we have a say in the matter. We're becoming increasingly dissatisfied, and consequently disengaged, from the way we learn in the formal space, when measured against the open learning we do in the social space. It's why North London rapper, Suli Breaks says, in his viral video of 2013, that he 'loves education, but hates school' and why workers avoid office-based training programmes, but eagerly take part in weekly Twitter discussions with colleagues around the world.

It's too easy to characterise those contrasting experiences in terms of the presence, or absence, of technology: mobile phones being confiscated in school; Facebook banned in the workplace. I believe that it's more complicated, and much more exciting, than that. The cause of our dissatisfaction lies not in being denied access to software or hardware but in being denied access to different ways of learning and different people to learn from. It turns out that

our preferences for how we learn in the social space are the polar opposites from those enforced by our institutions:

Learning in School, College & Work	Learning Socially
Formal: When, where, how and with whom is pre-determined	**Informal:** We learn when, where with whom, and how we please
Individual: We demonstrate our understanding and skills alone	**Social:** We study, and demonstrate our understanding in groups
Linear: Learners follow a sequential programme, according to the 'curriculum'	**Non-linear:** Learners follow non-sequential routes, according to interests
Just in case: Knowledge acquisition precedes actions	**Just in time:** Knowledge is gained as the task demands
Tutor-to-student: One expert, few learners	**Networked:** The expertise is in the crowd
Transmissive: Teacher transmits, (usually through lectures) students receive	**Experiential:** Meaning is made and shared, by experience

(Click to enlarge this table)

I'm not suggesting that all the learning taking place in businesses and schools is defined by the list in the left-hand column. Nor is social learning defined by all of the qualities on the right. But enough of it is to warrant a radical reappraisal of how we do things.

Open learning is frequently, and in my view, incorrectly trivialised as people 'just chatting' on social media. My belief is that this perception misses the point: 'open' is not simply about technology, it's about behaviour shift as well.

In the 1980s, the proliferation of what became known as 'e-learning' saw our learning institutions take traditional face-to-face methods of teaching and learning, and digitise them. The promise it offered was only matched by our sense of disappointment in what materialised, as the novelty of switching on a computer replaced attending a lecture, and words on a screen replaced words on a page. E-learning in colleges and universities suffered the same fate as the 'interactive whiteboard' in schools: a quick hop from 'this changes everything' to 'well, that

didn't work'. Digital technologies will no more solve the so-called 'crisis in education' than airbags will stop drivers from having accidents.

What digital technologies can do, however, is to dramatically accelerate the changes in behaviours, values, and actions, which then transform the way we learn and our capacity to learn. Most people working in learning have experienced one of those light-bulb moments when they realise the enormity of the change that is upon us. Mine was when I realised formal education could no longer look upon learning which happens socially as either inferior or complementary. Rather, it's a direct challenge to centuries-old orthodoxies, and simply can't be ignored. The light bulb went off in an unlikely, and unexpected, place.

In 2005, I took both my then adolescent sons to the WOMAD Festival of World Music in Rivermead, England. Since it was the first time either of them had heard many of the musical styles being showcased that weekend, I was curious to see which of them would grab their interest. It turned out that the band which had the biggest impact on my eldest son, Jack, was a group of Tuvan throat singers, called Huun-Huur-Tu. Tuva is one of the remotest parts of Russia, bordering on Outer Mongolia, and throat singing creates some of the most extraordinary sounds you're ever likely to hear. The technique is often called 'overtone' singing, because the voice manages to create several pitches at once. To western ears, where we were reasonably satisfied with just the one pitch at a time, it sounds both magical and, because the overtones come from deep in the throat and have to be forced out, quite painful.

Like many traditional forms of music, it's a lot more complex than it first appears. Conventional Tuvan wisdom has it that you would need to spend years of apprenticeship with an acknowledged master singing, gradually exploring hitherto inaccessible regions of the larynx and vestibular folds, before you could produce overtones. And there's not just one technique. A quick dip into Wikipedia reveals that 'the three basic styles are khoomei, kargyraa and sygyt, while the sub-styles include borbangnadyr, chylandyk, dumchuktaar, ezengileer and kanzyp. In another, there are five basic styles: khoomei, sygyt, kargyraa, borbangnadyr and ezengileer. The sub-styles include chylandyk, despeng borbang, opei khoomei, buga khoomei, kanzyp, khovu kargyraazy, kozhagar kargyraazy, dag kargyraazy, Oidupaa kargyraazy, uyangylaar, damyraktaar, kishteer, serlennedyr and byrlannadyr'. (Top tip: don't ever try to beat a Tuvan at Scrabble.)

So, imagine my astonishment when, a mere six weeks after the WOMAD festival, Jack asked me if I'd like to hear his kargyraa. "Sure," I replied, pretending I knew what he was talking about. He then produced a deep growling sound which, gradually, layered a sweet, melodic, whistle-like overtone on top. I could not have been more astonished. I knew that he'd not undertaken any trips to Mongolia in the previous six weeks. Nor, to the best of my

knowledge, was he proficient in herding horses. How, I asked, had he managed to acquire a skill that takes years of mentored study? "Oh, some English bloke spent a few years over there, and stuck a bunch of free modules up on the net. I just taught myself by following them."

This was my introduction to the open learning phenomenon that is sweeping the globe. From years of face-to-face apprenticeship, to just a few weeks of online study. And in 2005, this phenomenon had barely started. If Jack wanted to further extend his Tuvan repertoire (though I think his interest probably waned once the novelty of being able to do something totally unexpected wore off), all he'd have to do is to Google 'Tuvan throat singing', and he'd have 1.5 million avenues to explore: YouTube tutorial videos by the hundred; overtone singing forums by the score; a regular Tuvan Throat evening in a pub in Darwen, Lancashire; someone in Australia looking for an online coach; and, of course, the inevitable Facebook Tuvan Throat Singing page. Don't take my word for it. Google it yourself.

Fortunately, there aren't any actual Throat Singing Schools in northern England. Because if there were, they'd have to be finding a new business model. 'Open' is fundamentally challenging teachers of just about everything.

One of the reasons behind MOOCs popularity in the US is that public investment now demands a better return, particularly in student achievement. It's not widely known, but of the 18 developed nations participating in the Organisation for Economic Co-operation and Development (OECD) assessments, the US comes bottom on college graduation rates. There's considerable room for improvement.

For example, in 2011, four-year graduation rates for the San Jose State University (SJSU) were just *seven percent*; fewer than 50 percent of their students graduated after six years. Despite these appallingly low statistics, SJSU sits mid-table in the national public university rankings. As performance indicators go, we're in a sea of low expectations.

The Governor of California, Jerry Brown decided something had to be done. In January 2013, he announced plans to pilot remedial online courses, delivered by Coursera's rival, Udacity, at SJSU. Governor Brown was no doubt emboldened by a review of research, undertaken by the US Department of Education, which concluded that 'students who took all or part of their class online performed better, on average, than those taking the same course through traditional face-to-face instruction'.[6] If the pilot programme succeeds, open online learning is likely to be introduced in all Californian universities, and when it comes to education, what California does today, the rest of America does tomorrow.

Arthur C. Clarke famously said that "Teachers who can be replaced by a machine, should be". David Thornburg reworded it to "Any teacher that can be replaced by a computer, deserves to be". Around the world that replacement process is starting to happen, as more

courses go online, and more video tutorials are uploaded. As the evidence accumulates that online learning at worst does no harm and at best out-performs face-to-face, more learning institutions and teachers will have to 'blend' their teaching. We will see more alternatives to lectures in large halls, via anytime, anywhere online viewings. But it isn't simply the when and where of learning that's being transformed – it's the how, too.

Back To the Future

The aspect of 'open' that is the most thrilling is the nexus of old and new. Put simply, the incredible tools we now have at our disposal are bringing us back to ways of learning that had long been discredited. To fully explain this, I need to give a potted history of how learning is organised. As we don't have the space, it will be necessarily simplistic, I'm afraid, but you'll get the point.

As far back as the Ancient Greeks, educators have disagreed about how people learn best. The historian Plutarch's quote that 'The mind is not a vessel to be filled, but a fire to be kindled', neatly encapsulates two opposing views. Those who advocate 'didactic' instruction put the teacher at the centre: the best way to learn is for the expert to transmit and the student to receive, pouring knowledge into an empty vessel. Retaining this knowledge has always been a bit of a challenge, so rote learning – memorising and reciting facts, multiplication tables, and so on – usually accompanied didactic/transmissive teaching.

As Sir Ken Robinson has brilliantly observed[7] this method of instruction[8] was easy to measure – didactic teaching begat rote learning, which in turn begat paper-based examination. It became the dominant method of learning in universities, neatly side-stepping the tiresome reality that in real life we're usually tested by our competence in performing tasks. Since we tend to only value what can be measured, that's the way it's stayed, until almost the present day.

The main vehicle for this form of learning is 'the lecture' and the main tool for rote learning became note taking. Once schools became universal they fashioned themselves after universities. I vividly remember endless 'lessons' in my secondary school that consisted of the teacher copying extracts from textbooks on to the chalkboard. We were then instructed to copy this into our notebooks. It was never explained why we had to do this – I can only presume that writing down what was already available in print was believed to assist memory. Clearly, little had changed since Mark Twain observed that 'College is a place where a professor's lecture notes go straight to the student's lecture notes without passing through the brains of either'.

There have, however, always been advocates of more 'experiential' or 'active' forms of

learning, where the student assumes the central role. John Dewey, Jean Piaget, Maria Montessori and Rudolph Steiner argued that the learner wasn't an empty vessel, but carried experiences and knowledge that should be progressively built upon with the learner's full and active involvement. With these approaches – broadly labelled 'constructivist' – it's the tutor's job to 'scaffold' experiences so that the learner can make connections, build confidence, reinforce skills, and apply knowledge to solve problems.

There have been some high-profile products of these so-called 'progressive' learning systems. For example, the founders of two of the most successful companies in the world – Amazon (Jeff Bezos) and Google (Larry Page and Sergey Brin) all attended Montessori schools. Larry Page credits going to Montessori, not Stanford University, as the reason for his success:

> "I think it was part of that training of not following rules and orders, and being self-motivated, questioning what's going on in the world, doing things a little bit differently."[9]

Despite notable alumni, advocates of constructivist teaching have been outnumbered by those calling for more traditional methods for perhaps a decade or more, at least in the UK and the US. Striving to achieve a high ranking in international comparison tables, like the Organisation for Economic Co-operation and Development's Programme for International Student Assessment (PISA), has fostered a desire to get 'back to basics'. Using high-stakes accountability to improve basic literacy and numeracy skills has been the focus of those countries attentions.

While the popular debate on how best to teach continues to swing back and forth, its anchor point – the centrality of school as an institution – has changed remarkably little over the past 150 years. For even the biggest critics of compulsory schooling it was hard to see how else we could educate young people. Even though I didn't enjoy my school career, pretty much the only alternative to going to school, during 1970s England, was to be home-schooled – and this was virtually unheard of among working-class families. The only other place you could acquire knowledge was in local libraries, but they were as boring as school.

The Inexorable Rise of The Informal

'Open' is shifting the focus of attention from how we should teach, to the best ways to learn. It's no longer about traditional vs progressive, didactic vs experiential. Instead, it's about what we can do for ourselves, how we can tap into the knowledge and expertise that is within all of us, but rarely mined. In short, it's about the rise of informal learning.

Informal opportunities to gain wisdom and practice new skills have mushroomed

exponentially, and this alters not just how we see knowledge, but how we see the power relationships behind that knowledge. The hierarchy between teacher and students is being transformed through open learning – from vertically downward (expert to novice) to horizontally networked (participant as expert and learner). Arising out of a number of behaviour shifts: the desire for informality; the uncovering of layperson expertise; and a loss of deference for 'experts', we are finally witnessing the transformation of learning. It has to be said that some teachers and academics are appalled by these shifts. It's hard to appreciate the significance of the loss of deference, and the attendant rise of informality, because they've crept up on us gradually over the past thirty years or so. Back then, our definition of 'informal' used to be very different.

I was a mature student in the early 80s. Having never believed I was bookish in any way, I was pleasantly surprised to get a first-class degree and for a while toyed with the idea of an academic career. Having applied for a PhD studentship there, I was invited to attend an 'informal' interview at the Open University in England. The panel consisted of thirty or so of the leading cultural theorists in the UK at the time. The 25 minutes that the interview took were so horrendous I have blanked them out of my memory, but the thing I will never, ever forget, was the point at which I was asked if I had any questions for the panel. Suppressing the urge to ask the real questions that were racing through my head ("Where's the exit?", "Could someone just shoot me now?") I asked if it would be possible, during my PhD studentship, to sit in on some lectures. Cue much sniggering, and then finally one of the professors loftily declaimed, *"We don't give lectures, we just write books!"*

Oh, how they all laughed.

I'm sharing this anecdote, not as therapy (though I do feel much better now, thank you) but because it illustrates our changing attitudes towards authority and informality. If those professors are still working at the Open University, they will not only be much more accountable, but they will have witnessed a redefinition of 'open'. The Open University is, thankfully, now making its resources available to anyone, and, in 2013, even launched a collaborative learning initiative: Social Learn.[10]

While there are some educators who see the rise of informality as a sure sign that we're all going to hell in a handcart, for many, shedding the responsibility of being expert-in-everything is not only liberating, it's radically changing the way they work. Encouraging learners to share what they know, and constructing knowledge together, subtly shifts our expectation of teachers and other leaders of learning: from giving authoritative answers to asking challenging questions; from the sage on the stage, to the guide on the side.

The best learning professionals appreciate the complexity of the dramatic changes we're

witnessing, and the implications for how we structure teaching and learning. Advancements in what we now know, in technology, neuroscience, emotional intelligence, self-perception, and much more, are making thoughtful practitioners fundamentally re-evaluate their work. The imperative now is not to incrementally improve traditional models, but to rethink everything, to make it 'open'.

The public debate, however, ignores this complexity for a more reassuring simplicity, encapsulated in Ken Robinson's lament: 'we keep trying to build a better steam engine'. Whenever education is discussed in the media, politicians and parents alike inevitably retreat into a 'when I was at school' certainty, based upon little more than a nostalgic belief that, if it worked for them, it should work for everyone. They are apparently oblivious to the challenge to formal education that the rise of the informal presents.

Why, for example, should the end-users of formal education – students – be satisfied with attending a physical centre five days a week, using technology that, in many schools, is slower and more restrictive than the tablet or mobile phone that they carry with them (but are usually prevented from using) when in school? Why should we continue to group young people by the year they were born, to study subjects copied from 19th-century universities, when their passion outside school is to develop skills, learning alongside people of all ages, effectively organising their own 'curriculum'?

Open For Business

While the political pendulum swings between more traditional and progressive approaches to teaching and learning, there has been rather more consistency in learning at work. And it turns out that, without the political intervention we see in formal education, we view approaches to learning as less of a battle between the didactic and experiential, and more of a blend.

We have had forms of apprenticeship, for example, since the Middle Ages. Raw novices acquired skills by observing and mimicking master craftsmen over an extended period of time. Indeed, acceptance as a craftsman was to be labelled 'time-served'. Apprenticeships were overseen by unions and tradesmen's guilds and worked very effectively until the loss of heavy industry in the West and the accompanying decline in trade unionism.

The white-collar equivalent of apprenticeship is the internship. Internships have become quite controversial in recent years. At its best, an internship is the route to a permanent job. At its most cynical, an internship ensures a university graduate is paid little or not paid at all, given little or no training, and has little prospect of a job at the end of the period of internship.

Notwithstanding, the potential for low-wage exploitation, internships and apprenticeships are generally favoured by employers because they are classic examples of the value of learning

by doing. Young people tolerate them because it's becoming increasingly difficult to go straight from higher or further education to a job, without something in between.

As we've seen, the global drive to lower production costs has fuelled the growth of knowledge process outsourcing. This means we're not only seeing jobs disappear, but with them, the learning capital of an organisation. If a business is simply buying in knowledge, as and when it's needed, how is it going to grow its own bank of knowledge and expertise?

Learning at work is, in fact, currently facing a kind of perfect storm: increasing business complexity; a growth in knowledge process outsourcing; consistently lowered production costs and a revolving door of employees and interns – all ratcheting up pressure on CEOs for quick fixes, and company functions like learning and development. To cap it all, the rise of open learning is now causing some CEOs to wonder whether there is any point in trying to nurture organisational learning at all.

What's known as 'open source learning' – where networked learners collaborate to improve practices, prototypes and models – is making innovation happen far quicker than a company's research and development department can manage. As a result, some major corporations have begun to look outside the organisation for innovation (more of this in the next chapter).

But they are in a minority. Most companies still see learning and development as a synonym for 'training' rather than innovation. Indeed, one of the indicators of the weather-vane nature of learning in the workplace is the uncertainty of where it fits into the organisational chart. Is it a function of research and development? Human resources, perhaps? Or should it be Knowledge Management? Or, as is the case with some enlightened companies, is learning everyone's responsibility?

Wherever it is located, our understanding of how employees learn best has undergone significant revision during the past thirty years or so. Aside from some maverick organisations, the predominant pattern has always been that knowledge travels downwards: from senior executives, to more lowly staff, via training materials and courses. Sometime around the mid-1990s we began to understand that knowledge could be found anywhere within a company, but that it needed to be coordinated. Enter Knowledge Management. Knowledge Management became fashionable around the millennium, though it has consistently struggled to accurately define itself. That struggle continues, because with open learning, the very idea of managing knowledge becomes almost contradictory.

We are slowly understanding that learning in the workplace has to travel upwards, as well as down. And to ensure that learning flows in both directions, we have to work with a complex set of factors: human behaviour, supportive technologies, workplace cultures, personal

motivation, employee engagement, to name but five.

The Informal At Work

A classic case of trying to stimulate knowledge growth is Xerox's Eureka Project. In the early 1990s Xerox's 20,000 customer service engineers were becoming more mobile, with more of them working on the road. As a result, technical know-how was becoming locked within individuals. By observing technicians on call-out it became apparent that when an engineer found a problem for which the manual had no answer, they contacted a colleague on a two-way radio.

The more unusual solutions were usually retold, and elaborated upon, at co-worker meetings. It was here that the Eureka moment arrived. Daniel Bobrow and Jack Whalen, of the Palo Alto Research Center, led a radical experiment in knowledge sharing: "It suggested to us that we could stand the artificial intelligence approach on its head, so to speak; the work community itself could become the expert system, and ideas could flow up from the people engaged in work on the organization's frontlines."[11]

Piloting the Eureka Project in France, customer service engineers were invited to submit tips through forum-based software. Few of Xerox's managers believed that there was any value to be gained from worker-produced tips and tricks. But the engineers – after some initial resistance – saw the benefits.

Gradually, the resource bank of solutions grew. Assuming that sharing professional secrets would need extrinsic motivation, Xerox initially offered CSEs a $25 incentive for uploading a tip on to the Eureka database. The workers rejected the offer. As one said, *"this would make us focus on counting the number of tips created, rather than on improving the quality of the database."* The incentive to contribute was simpler: workers simply wanted recognition, by having their name attributed to popular tips. By the time Eureka was rolled out across all Xerox countries in 2001, over 50,000 worker tips had been added to the database. Having now become a seminal example of a 'community of practice' the Xerox model has since been widely copied (pun intended).

The Eureka Project has become the stuff of legend in organisational learning because it was one of the earliest documented cases of the power of informal learning, shared and grown by the employees, not management.

The rise of the informal means that learning becomes harder to pin down, harder to manage. Michael Polyani was one of the early pioneers of informal learning. Until Polyani's emergence in the 1950s, few had challenged the dominance of what was known as the 'scientific method' of learning. This method is familiar to all scientists and relies upon a

sequenced operation: asking a question; forming a hypothesis; testing and analysing; replicating under controlled conditions; being reviewed by peers. It is as objective a process for gaining new knowledge as we have yet imagined. In medical research it has led to many breakthroughs, while also keeping patients safe.

Polyani, however, argued that when it comes to learning, true objectivity is impossible, since all acts of discovery are personal and fuelled by strong motivations and commitments.

Rather than being disappointed by the inevitable introduction of feelings, Polyani argued that we should welcome human passions in the workplace, since they lead to imagining, intuition and creativity. His belief that 'we can know more than we can tell' led to the emergence of 'tacit learning': we learn, not simply by logical reasoning, but by observing, absorbing, tinkering, following hunches. Tacit knowledge may be hard to define but there's no doubting its existence. Think about how you recognise a person's face. Now, try to explain it. That's tacit knowledge.

The really important aspect of tacit learning, as any apprentice will tell you, is that it's almost a process of osmosis. You gain more insight from simply being around someone, and sharing experiences with them, than you would do by explicit instruction. There's nothing new in this revelation: it was, after all, Confucius who said *"I hear and I forget, I see and I remember, I do and I understand"*. Tacit knowledge is gained most frequently through 'action learning', working with others on problems, acting and then reflecting on those actions. That Polyani's theories took hold at precisely the time that 'knowledge management' was gaining momentum must have been something of a mixed blessing for learning officers. There's a limit to the amount of 'managing' of tacit knowledge that can be done.

The wisest course of action is to create the right learning environment, culture and context, which brings people together to learn from each other. The old joke that 'collaboration is an unnatural act between non-consenting adults' may have had its roots in corporations trying to break down silo mentalities. But if 'open' tells us anything, it points to a realisation that we have to understand how people learn when they have a choice (in what to learn, and who to learn with) and bring that into the places where they are required to learn.